2007 Trial School Certificate Test

Mathematics

Class

Student Number

Section 1

25 marks

Time allowed for this section is 30 minutes

Answer Questions 1–25 in the spaces provided

Calculators are NOT to be used in this Section

There will be a short break between Section 1 and Section 2.

2007 TRIAL SCT • NEWINGTON COLLEGE MATHEMATICS • SECTION 1

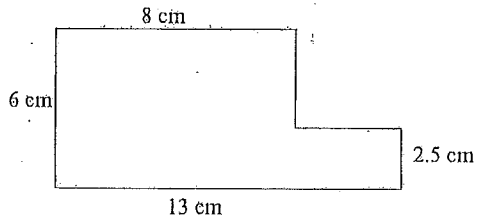
Section 1

25 marks

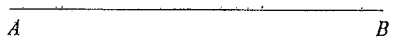
Answer the questions 1–25 in the spaces provided.

1 Given that $18 \times 756 = 13\,608$ and $9 \times \square = 13\,608$, what is the value of $\square$?

2 What is the perimeter of the following shape?



3 Lewis starts to construct $\angle ABC$ by drawing interval AB. Use your instruments to construct this angle if $\angle BAC = 134$ degrees.



4 Write the next number in the sequence 2, 6, 14, 30, ...

5 Celeste's water tank holds 9000 litres of water when full. If the tank is 40% full how many litres of water does it contain?

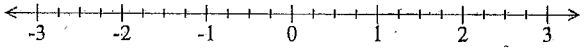
6 The stem and leaf plot represents the results achieved by 15 students in a Mathematics test.

3	014
2	2446789
1	2358
0	6.

What is the range of marks achieved by these students?

7 Robyn's Internet connection has a speed of 400 kilobytes per second. She needs to download a 360 000 kilobytes video file. How many minutes will it take to download this file?

8 Mark the position of -2.4 with a cross (×) on this number line.



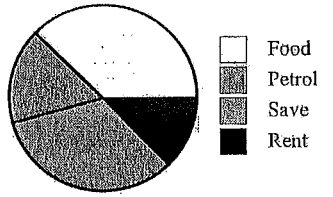
9 A train is due to depart at 6.40 pm. How long does Cameron have to wait for the train if the current time is 9.12 am. Give your answer in hours and minutes.

10 Solve the equation $6+\frac{x}{2}=10$

11 A pair of jeans was originally marked at $90 is reduced in price by 30%. A further discount of $33\frac{1}{3}$% off the discounted price was offered for cash only. What price does the customer pay for the jeans if they pay cash?

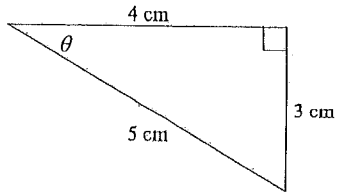
12 $276 \div 23 = 12$
What is the value of $276 \div 2.3$?

13 Melissa spends a total of $480 as shown by the sector graph. How much does she save each week?



14 By how much is $\frac{4}{5}$ greater than $\frac{3}{4}$?

15



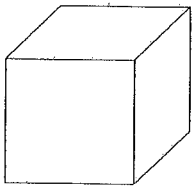
Not to scale

What is the value of $\sin\theta$?

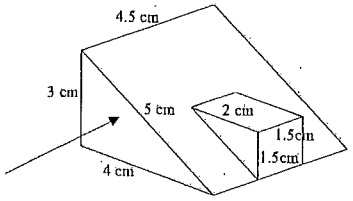
16 Complete the table below, using the rule $y = 3x - 2$.

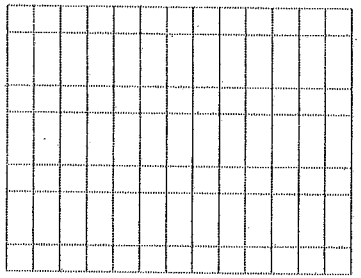
x	7	2	4
y	19	4	

17 A cube has a surface area of 54 cm^2. Calculate the length of each edge of this cube.

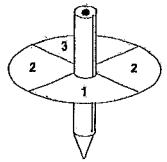


18 What is the view of this solid from the direction of the arrow?





19 A spinner is divided into four equal sections. The sections are labelled using the digits 1, 2 and 3.



Kelly makes the statement.

'The spinner is equally likely to stop on an even number.'

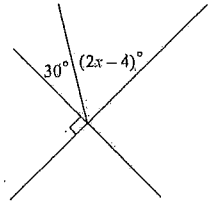
Explain Kelly's statement.

20 A score was added to the set of scores: 15, 18, 20, 22, 24, 26

The new mean is equal to 20.

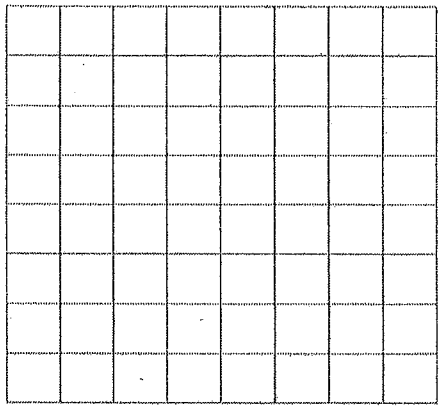
What score was added?

21 Find the value of x in the diagram below.

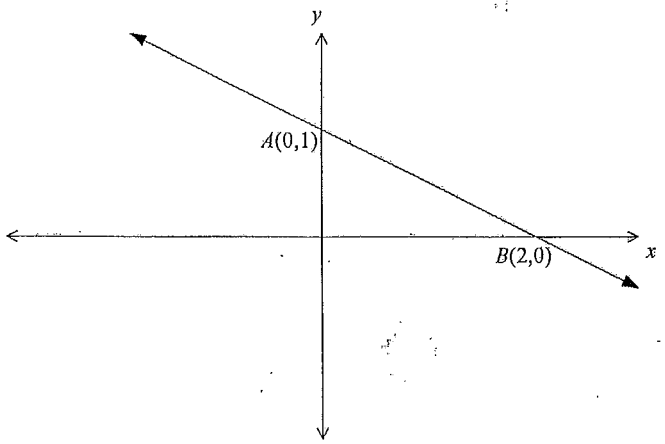


22 $(8.25\times10^7)-(3\times10^5)=$
(Answer in scientific notation)

23 In the grid below draw a kite with an area of 14 cm^2.



24 A line passes through the points $A\,(0,1)$ and $B\,(2,0)$.



Find the equation of the line AB.

2007 TRIAL SCT • NEWINGTON COLLEGE MATHEMATICS • SECTION 1

25 Use your instruments to construct an isosceles triangle $\triangle ABC$ with side lengths of 5 cm, 5 cm and 6 cm.

2007 Trial School Certificate Test

Mathematics

Section 2

75 marks
Time allowed for this section is
1 hour and 30 minutes

This section has TWO parts

Part A – Questions 26–80 55 marks
Part B – Questions 81–84 20 marks

Calculators may be used in this section

Do not commence Section 2 until you are instructed to do so

Part A

Questions 26–80 55 marks

Use the Section 2 – Part A – Answer Sheet for Questions 26–80

Instructions for answering multiple-choice questions

- For Questions 26–75, select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

  Sample: $2 + 4 =$ (A) 2 (B) 6 (C) 8 (D) 9

  A ○ B ● C ○ D ○

- If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

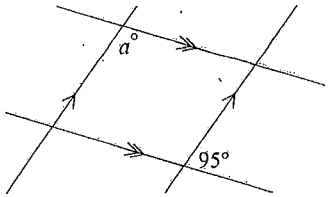
  A ● B ⊗ C ○ D ○

- If you change your mind and have crossed out what you consider to be the correct answer, then indicate the correct answer by writing the word correct and drawing an arrow as follows.

  correct ↙

  A ● B ⊗ C ○ D ○

26 Anne was required to find the value of a.



She started with 95° and in two steps correctly found the value of a. Which types of angles could Anne have used?

(A) Alternate and co-interior angles

(B) Corresponding and alternate angles

(C) Alternate and corresponding angles

(D) Co-interior and vertically opposite angles

---

27 If $950\,000 = 9.5\times10^{n}$, the value of n is

(A) -5

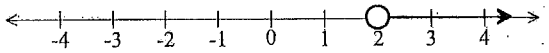
(B) -4

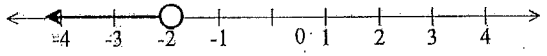
(C) 4

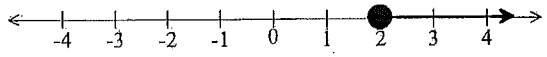
(D) 5

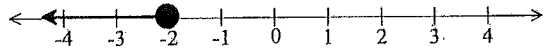
---

28 The graph that illustrates the solution of $-4x > 8$ is

(A) 

(B) 

(C) 

(D) 

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29 Kayla works for three hours at 'time and a half'. She earns \$72.00. Find her normal hourly rate.

(A) \$16.00

(B) \$24.00

(C) \$36.00

(D) \$324.00

---

30 A house contains four girls, three boys and two adults. If one person is chosen at random, what is the probability that the person is girl?

(A) $\frac{1}{4}$

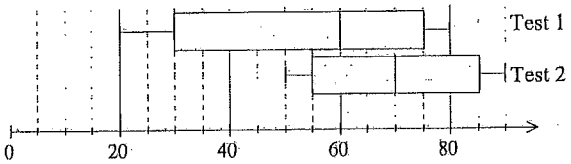
(B) $\frac{4}{9}$

(C) $\frac{1}{2}$

(D) $\frac{4}{5}$

---

31 The results of two Mathematics tests are displayed in the following box-and-whisker plot.



Which of the following statements is correct?

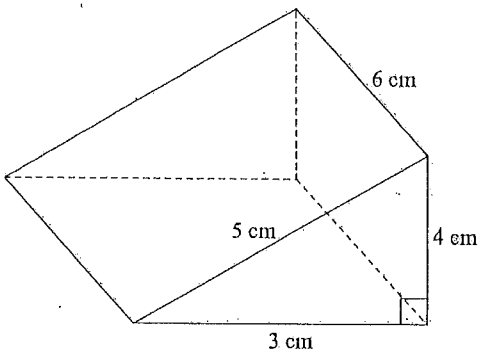
(A) Lowest score for Test 1 is 30

(B) Highest score for Test 2 is 85

(C) Median for Test 1 is 50

(D) Range for Test 2 is 40

32



Not to scale

The volume of this triangular prism is

(A) 36 cm^3

(B) 60 cm^3

(C) 72 cm^3

(D) 120 cm^3

---

33 Ryan invested $800 at 7% per annum. The simple interest earned between 30 September and 1 January is

(A) $4.67

(B) $14.00

(C) $18.67

(D) $56.00

---

34 $5x-4(x-2)=$

(A) $x+2$

(B) $x-2$

(C) $x-8$

(D) $x+8$

---

35 A plane left at 10.15 pm and arrived at its destination at 2.35 pm the next day. How long did it take for the journey?

(A) 4 hours 20 minutes

(B) 7 hours 40 minutes

(C) 16 hours 20 minutes

(D) 19 hours 40 minutes

---

36 Which two temperatures are closest to each other?

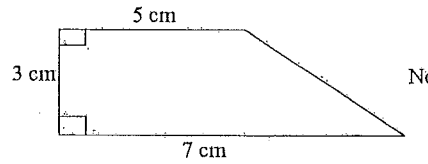
(A) -7°C and -4°C

(B) -3°C and 4°C

(C) 3°C and 7°C

(D) -4°C and 4°C

37



Not to scale

The area of this figure is

(A) 18 cm^2

(B) 21 cm^2

(C) 27 cm^2

(D) 35 cm^2

---

38 The number 0.000 635 written in scientific notation is

(A) 6.35×10^{-4}

(B) 6.35×10^{4}

(C) 6.35×10^{-5}

(D) 6.35×10^{5}

---

39 An energy company's charges for gas over a three-month period are shown in the table below.

First 750 MJ	1.3920 cents per MJ
Additional MJ over 750	1.3330 cents per MJ

The Sanderson's used 2500 MJ of gas in this period. The total cost of this gas is

(A) $20.44

(B) $33.33

(C) $33.77

(D) $41.54

---

40 Given $v = u + at$ and $v = 25$, a correct set of values for u, a and t is

(A) $u = -5,\ a = 10,\ t = 3$

(B) $u = -5,\ a = 10,\ t = -3$

(C) $u = 5,\ a = -10,\ t = 3$

(D) $u = 5,\ a = -10,\ t = -3$

---

41 Kara scored 90, 49, 90, 75, 65 and 56 in her Trial SC exams. Which of the following measures would Kara prefer to tell her parents?

(A) Mean

(B) Mode

(C) Median

(D) Range

---

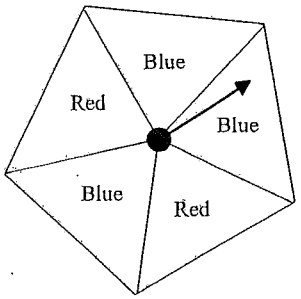
42 The arrow on this regular pentagon is spun 300 times. Each result is recorded as blue or red. If the probability of each result is equal, which of the following is most likely

(A) 150 blue and 150 red

(B) 175 blue and 125 red

(C) 200 blue and 100 red

(D) 160 blue and 140 red



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43 If $x = 16$, what is the value of $4x^{1/2}$

(A) 8

(B) 16

(C) 32

(D) 64

---

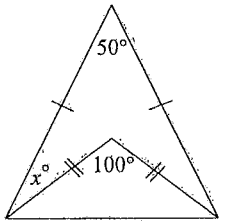
44 The value of x is

(A) 25°

(B) 50°

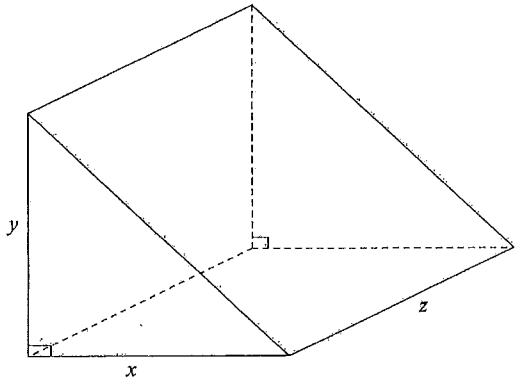
(C) 75°

(D) 100°



Not to scale

45



The diagram shows a triangular prism with a base edge of x cm, a triangular height of y cm and a width of z cm. What is the volume of the prism in cubic centimetres?

(A) $x + y + z$

(B) $x^2 + y^2$

(C) xyz

(D) $\frac{xyz}{2}$

---

46 Benjamin takes out a loan of $40 000 over a term of five years.

Monthly repayments

Amount of loan	Term of loan		
	3 years	4 years	5 years
$10 000	$355	$289	$251
$20 000	$710	$577	$501
$30 000	$1064	$866	$752
$40 000	$1419	$1155	$1002
$50 000	$1774	$1444	$1253

How much interest will Benjamin pay over the term of the loan?

(A) $1002

(B) $5010

(C) $20 120

(D) $60 120

---

47 Jasmine is booked to leave on an overseas flight on 3 July. She must pay her fare at least 15 days before departure. What is the date of the last day on which she can pay her fare?

(A) 17 June

(B) 18 June

(C) 19 June

(D) 20 June

---

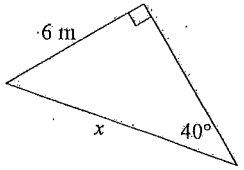
48 The value of x is

(A) $6\tan 40$

(B) $\dfrac{6}{\tan 40}$

(C) $6\sin 40$

(D) $\dfrac{6}{\sin 40}$



49 $\dfrac{x^2}{4}+\dfrac{2x^2}{7}=$

(A) $\dfrac{3x^2}{28}$

(B) $\dfrac{3x^2}{11}$

(C) $\dfrac{15x^2}{28}$

(D) $\dfrac{15x^2}{11}$

---

50 The figure is a parallelogram.

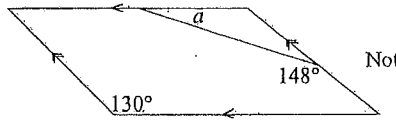
What is the value of angle a?

(A) 18

(B) 42

(C) 74

(D) 88



Not to scale

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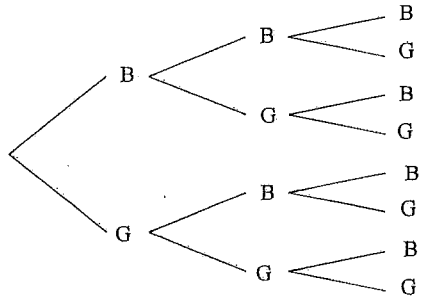
51 The tree diagram shows all possible combinations for families with three children. The probability of a three-child family consisting of two boys and one girl is

(A) $\dfrac{1}{8}$

(B) $\dfrac{1}{4}$

(C) $\dfrac{3}{8}$

(D) $\dfrac{2}{3}$



52 What is the correct rule for this table of values?

x	-3	-2	-1	0	1	2	3
y	-5	-3	-1	1	3	5	7

(A) $y = x+3$

(B) $y = 2x+1$

(C) $y = 2x-1$

(D) $y = x+1$

---

53 The results of a speed camera on Green Road are recorded below.

Over the speed limit (km/h)	Class centre	Number of cars
1–5	3	40
6–10	8	25
11–15	13	20
16–20	18	10
21–25	23	5

What is the mean over the speed limit for this data?

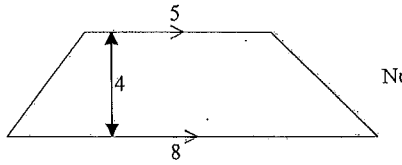
(A) 8 km/h

(B) 8.25 km/h

(C) 8.75 km/h

(D) 13 km/h

54



Not to scale

The dimensions of this figure are in metres. What is the area?

(A) 26 m^2

(B) 40 m^2

(C) 64 m^2

(D) 160 m^2

---

55 Isabella decides to buy a car for \$24 000. She has saved \$6000 for the deposit and takes out a loan over two years for the balance. The flat rate of interest charged is 12% per annum. The total amount of interest to be paid is

(A) \$1440

(B) \$2160

(C) \$4320

(D) \$5760

---

56 The midpoint of the interval joining $(7,5)$ and $(-9,1)$

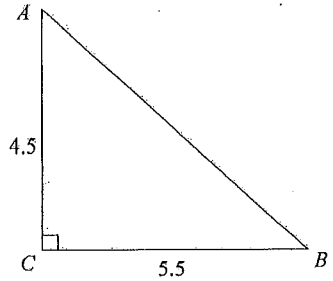
(A) $(-1,2)$

(B) $(-1,3)$

(C) $(-2,4)$

(D) $(8,2)$

57



Not to scale

What is the size of angle CAB to the nearest degree?

(A) 39

(B) 42

(C) 48

(D) 51

---

58 Use your calculator to evaluate $\dfrac{\sqrt{5}-1}{2\sqrt{2}}$ correct to 2 decimal places.

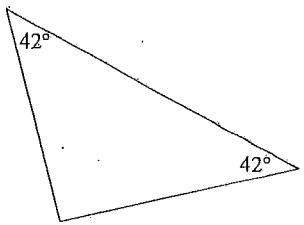
(A) 0.44

(B) 0.87

(C) 1.52

(D) 1.53

59



Not to scale

The diagram represents a triangle which is

(A) obtuse angled and isosceles

(B) obtuse angled and scalene

(C) acute angled and isosceles

(D) acute angled and scalene

---

60 Which expression has $x+5$ as a factor?

(A) $5x+10$

(B) x^2+25

(C) x^2+5x

(D) $5x^2+25$

---

61 David chooses one ball at random from his golf bag. What is the probability of him *not* choosing a 'Maxfli'?

Type of golf ball	Quantity
B51 Impact	3
Maxfli	5
Pinnacle	13

(A) $\frac{1}{5}$

(B) $\frac{5}{21}$

(C) $\frac{1}{3}$

(D) $\frac{16}{21}$

---

62 In Gibson Avenue there are three high school students, four primary school students and five preschool students. One student from Gibson Avenue is chosen at random. What is the probability that a primary school student is chosen?

(A) $\frac{1}{12}$

(B) $\frac{1}{3}$

(C) $\frac{1}{2}$

(D) $\frac{2}{3}$

---

63 $12x^6+4x^3=$

(A) $3x^3$

(B) $8x^3$

(C) $3x^2$

(D) $8x^2$

---

64 Washing machine concentrate is sold in four different sizes. Which represents the best buy?

(A) 1.5 kg for \$7.40

(B) 2 kg for \$8.60

(C) 2.5 kg for \$11.10

(D) 3 kg for \$13.50

---

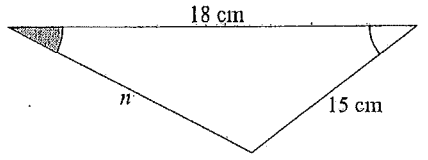
65 In the diagram

(A) $m=6$ cm, $n=9$ cm

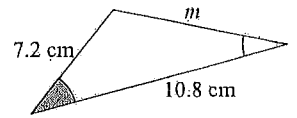
(B) $m=7$ cm, $n=10$ cm

(C) $m=8$ cm, $n=11$ cm

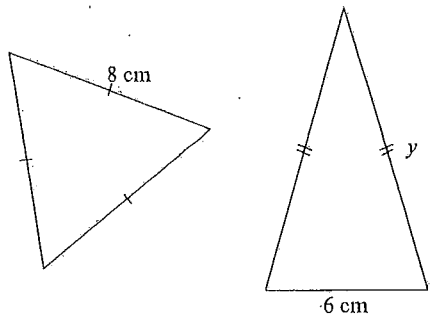
(D) $m=9$ cm, $n=12$ cm



Not to scale



66



Not to scale

The above triangles have the same perimeter. What is the value of y in centimetres?

(A) 6

(B) 8

(C) 9

(D) 10

---

67 $2^3 \times 3^2 =$

(A) 5×5

(B) 8×9

(C) 5^5

(D) 6^6

---

68 If m is an even number then the next largest even number is

(A) $m+1$

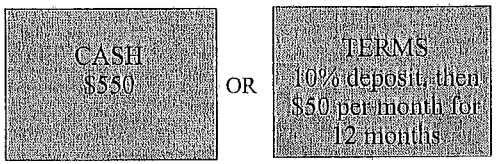
(B) $m+2$

(C) $2m+1$

(D) $3m$

---

69 A lawn mower is advertised in this way.



John is considering paying cash or buying on terms. How much extra is paid by buying on terms?

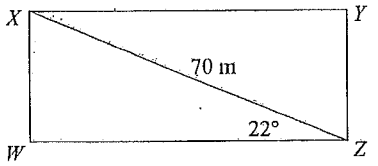
(A) $55

(B) $105

(C) $600

(D) $655

70



Not to scale

The diagram represents a rectangular block of land. The diagonal of the block is 70 metres long. The angle the diagonal makes with the side WZ is 22 degrees. The length of XW to the nearest metre is

(A) 26

(B) 27

(C) 28

(D) 29

---

71 The following frequency table shows the results of a test out of 20.

Score (x)	Freq (f)	fx
13	9	
14	3	
15	4	
16	1	
17	1	

The mean of this data to the nearest whole number is

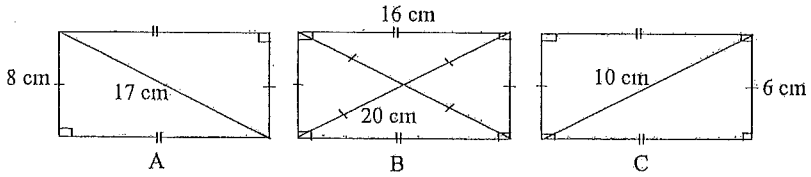
(A) 13

(B) 14

(C) 15

(D) 16

72



Which of the following statements is correct?

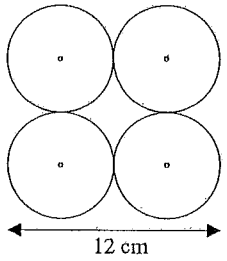
(A) Rectangle A is similar to rectangle C

(B) Rectangle A is similar to rectangle B

(C) Rectangle B is similar to rectangle C

(D) Rectangle A, B and C are similar

73 Four circles of the same size are used to create the shape below.



The circumference of the four circles is

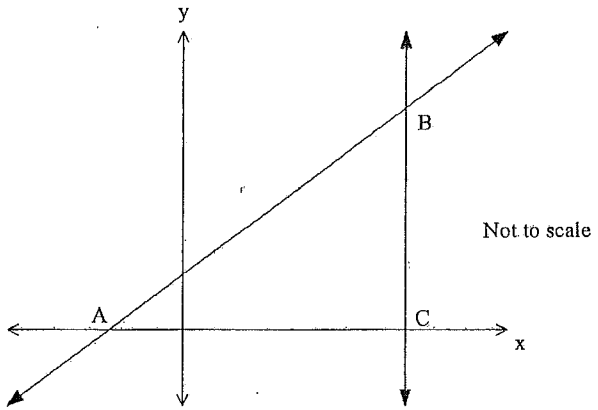
(A) 12π

(B) 24π

(C) 48π

(D) 96π

74 Line AB $(y = x+1)$ and line BC $(x = 3)$ are drawn below.



The area of ΔABC, in square units, is

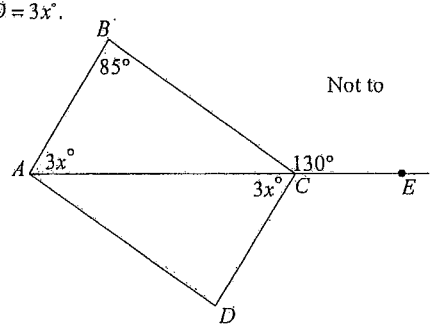
(A) 4

(B) 8

(C) 9

(D) 16

75 The diagram shows quadrilateral $ABCD$ with $\angle ABC = 85^\circ$, $\angle BCE = 130^\circ$ and $\angle BAC = \angle ACD = 3x^\circ$.



What is the value of x?

(A) 10

(B) 15

(C) 30

(D) 43

Instructions for Questions 76–80

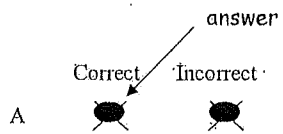
- Questions 76–80 contain options A, B, C or D. Each option may be Correct or Incorrect. In each question, one, two, three or four options may be Correct.
- For Questions 76–80, fill in the response ovals on the Section 2 – Part A – Answer Sheet to indicate whether options A, B, C or D are Correct or Incorrect. You must fill in either the Correct or the Incorrect response oval for each option.

				Correct	Incorrect
Sample:	A	$2+4=4+2$	A	●	○
	B	$2-4=4-2$	B	○	●
	C	$2\times 4=4\times 2$	C	●	○
	D	$2\div 4=4\div 2$	D	○	●

- If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

	Correct	Incorrect
A	●	⊗

- If you change your mind and have crossed out what you consider to be the correct answer, then indicate the correct answer by writing the word **answer** and drawing an arrow as follows.



76 $2\left(\frac{8x}{2}\right)^0 =$

Indicate whether each of the following is correct or incorrect.

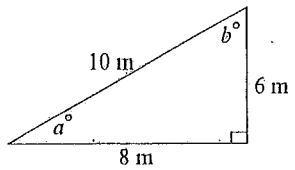
(A) 2

(B) $8x$

(C) $2(4x)^0$

(D) 1

77



Indicate whether each of the following is correct or incorrect.

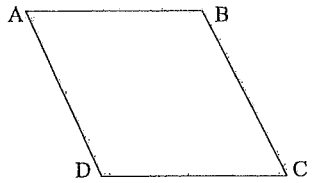
(A) $\cos b = \frac{6}{10}$

(B) $\tan b = \frac{6}{8}$

(C) $\sin a = \frac{8}{10}$

(D) $\cos a = \frac{8}{10}$

78



Which of the following statements about the diagonals of rhombus $ABCD$ are correct or incorrect?

(A) The diagonals are equal

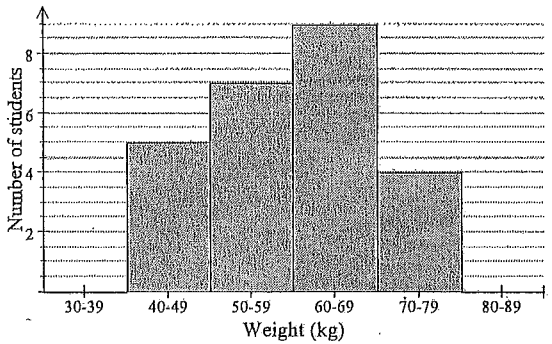
(B) The diagonals bisect each other

(C) The diagonals intersect at right angles

(D) The diagonals bisect the angles through which they pass.

---

79 A frequency histogram was created using the weight of 25 Year 10 students.



Indicate whether each of the following is correct or incorrect.

(A) The class centre of 40–49 kg is 44.5 kg

(B) The modal class is 60–69 kg

(C) The range is 39.

(D) The median would be below 60 kg.

---

80 If x is a number between 16 and 21 and y is a number between 4 and 9, then $\frac{x}{y}$ must be a number between the following numbers. Indicate whether each of the following is correct or incorrect.

(A) $2\frac{1}{3}$ and 4

(B) $1\frac{7}{9}$ and 10

(C) $\frac{4}{21}$ and 5

(D) $\frac{9}{16}$ and $5\frac{1}{4}$

2007 Trial School Certificate Test

Mathematics

Section 2 – Part B

Class

Student Number

Questions 81–84 20 marks

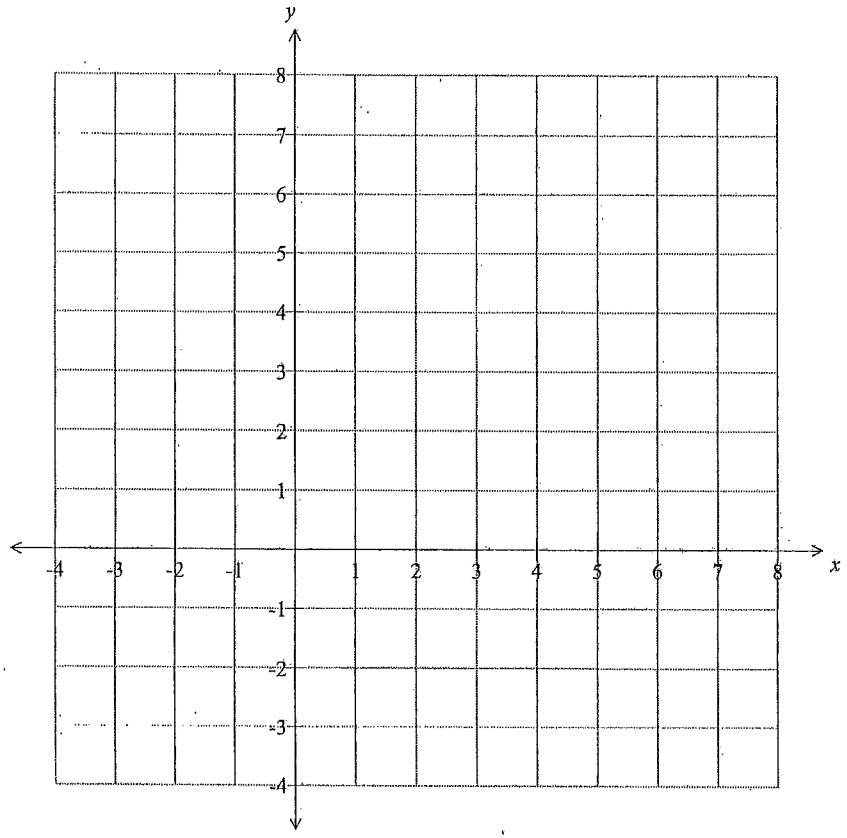
Answer questions in the spaces provided.

Marks

Questions 81 (5 marks)

(a) On the number plane below, plot the points 1

A (–2, 5) and B (4, 2)



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(b) The midpoint of the interval AB is M. Find the coordinates of M. 1

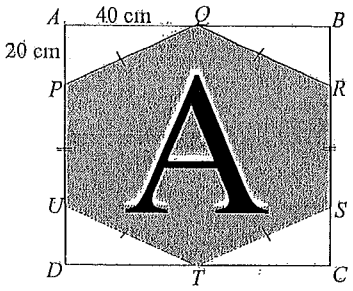
(c) A line parallel to the y-axis passes through M and meets the x-axis at C. 1

What is the equation of this line?

(d) Find the area of $\triangle MCB$ to the nearest square unit. 2

End of Question 81

Questions 82 (5 marks)



Not to scale

(a) A hexagonal sign is made by cutting four congruent triangles from a square. **1**
Calculate the area of one of the triangles.

(b) What is the area of the square $ABCD$? **1**

(c) Calculate the area of the hexagonal sign $PQRSTU$? **1**

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(d) Use Pythagoras's theorem to calculate the length of the side PQ. **1**
Give your answer correct to the nearest centimetre.

(e) Calculate the perimeter of the hexagon $PQRSTU$. **1**
Give your answer correct to the nearest centimetre.

End of Question 82

Marks

Questions 83 (5 marks)

Daniel works in a shop and earns $21.60 per hour at the normal rate. Each week he works 15 hours at the normal rate and 4 hours at time-and-a-half each week. 1

(a) Calculate Daniel's weekly wage.

(b) Daniel aims to increase his weekly wage to $540 by working extra hours at the normal rate. How many extra hours must Daniel work? 1

(c) Daniel's rate of pay increased by 5%. What is his new hourly rate for normal hours? 1

(d) Daniel has saved $6000 to buy a new car. He has decided to invest the $6000 in a term deposit for three years at 8% p.a. compounding annually. How much interest will Daniel earn in this account? Give answer to the nearest cent. 2

End of Question 83

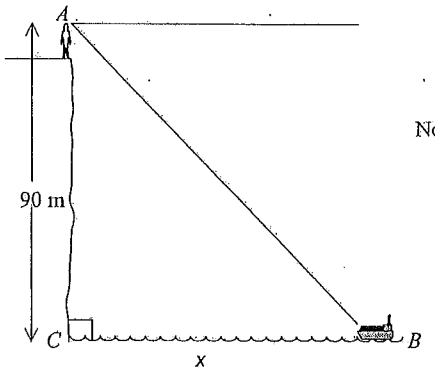
2007 TRIAL SCT • NEWINGTON COLLEGE MATHEMATICS • SECTION 2

Marks

Questions 84 (5 marks)

Cathy is standing on a vertical cliff and observing a ship out to sea.

She is 90 metres above sea level



Not to scale

The angle of depression of the ship, B, from A is $40°$.

(a) Label the angle of depression on the diagram above. 1

(b) Calculate the distance the ship is out to sea, x, to the nearest metre. 1

(c) The ship is travelling out to sea at a speed of 18 km/h. How far will the ship be out to sea after 1 minute? Give your answer to the nearest metre. **2**

(d) Cathy estimates the angle of depression of the ship, B, from A after 1 minute to be less than 15°. **1**

Do you agree with Cathy's estimation? Justify your answer, showing mathematical calculations.

End of Question 84

End of Paper

2007 Trial School Certificate Test

Mathematics

Class

Student Number

Sherilyn Chan.

Section 1

25 marks

Time allowed for this section is 30 minutes

Answer Questions 1–25 in the spaces provided

Calculators are NOT to be used in this Section

There will be a short break between Section 1 and Section 2.

2007 TRIAL SCT • NEWINGTON COLLEGE MATHEMATICS • SECTION 1

Section 1

25 marks

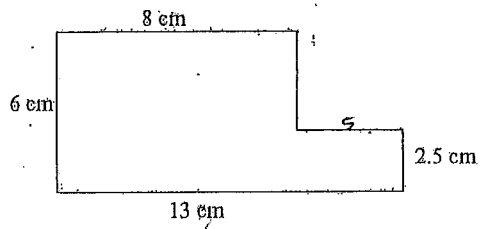
Answer the questions 1–25 in the spaces provided.

1 Given that $18 \times 756 = 13\,608$ and $9 \times \square = 13\,608$, what is the value of $\square$?

$\times 756$
$\frac{\ \ 12}{1512}$

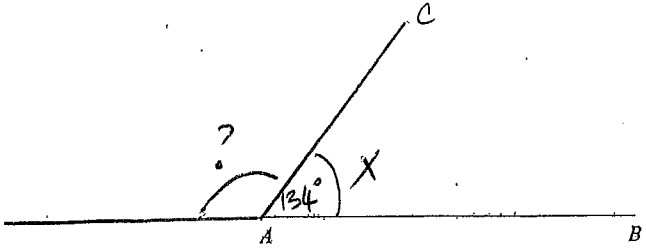
value of □ is 1512 ✓

2 What is the perimeter of the following shape?



$P = 8+6+13+2.5+5+3.5$
$= 38$ cm ✓

3 Lewis starts to construct $\angle ABC$ by drawing interval AB. Use your instruments to construct this angle if $\angle BAC = 134$ degrees.



4 Write the next number in the sequence 2, 6, 14, 30, ...

$30 \times 2 + 2$ ✓
$= 62$ ✓

5 Celeste's water tank holds 9000 litres of water when full. If the tank is 40% full how many litres of water does it contain?

~~0.4×9000~~ $\frac{40}{100} \times \frac{9000}{1} = 3600L$ ✓

6 The stem and leaf plot represents the results achieved by 15 students in a Mathematics test.

3	014
2	2446789
1	2358
0	6.

What is the range of marks achieved by these students?

34−6

= 28 ✓

7 Robyn's Internet connection has a speed of 400 kilobytes per second. She needs to download a 360 000 kilobytes video file. How many minutes will it take to download this file?

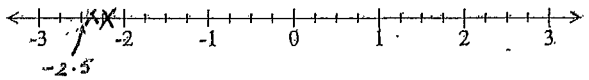
400 × 60 = 24000

400 kilobytes / second

24000 KB / minute ∴ it will take 15 minutes ✓

15
24000)360000

8 Mark the position of -2.4 with a cross (×) on this number line.



9 A train is due to depart at 6.40 pm. How long does Cameron have to wait for the train if the current time is 9.12 am. Give your answer in hours and minutes.

9:12am → 6:40pm = 9 hours

$\frac{40}{-12}$

28

∴ it will take 9 hours, 28 minutes. ✓

10 Solve the equation $6+\frac{x}{2}=10$

$12+x=20$

$x=8$ ✓

11 A pair of jeans was originally marked at $90 is reduced in price by 30%. A further discount of $33\frac{1}{3}$% off the discounted price was offered for cash only. What price does the customer pay for the jeans if they pay cash?

$30\% \times 90$

reduced price $63 ✓

$\frac{33\frac{1}{3}}{100} \times \frac{63}{1} = \frac{100}{3} \times \frac{63}{100} \times \frac{1}{1}$ ✓

$= \frac{2100}{100} = \$21$

$63 - 21 = 42$

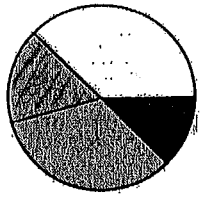
∴ the customer will pay $42 ✓

12 $276 \div 23 = 12$

What is the value of $276 \div 2.3$?

120 ✓

13 Melissa spends a total of $480 as shown by the sector graph. How much does she save each week?



$480 \times 30 = 14400$

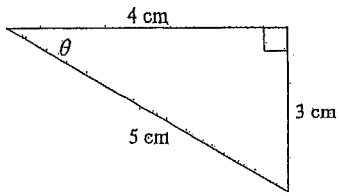
she saves 30% of weekly income. $\frac{30}{100} \times \frac{480}{1}$ ✓

= $144 ✓

14 By how much is $\frac{4}{5}$ greater than $\frac{3}{4}$? $\frac{4}{5} = \frac{16}{20}$ $\frac{3}{4} = \frac{15}{20}$

∴ $\frac{4}{5}$ is $\frac{1}{20}$ greater than $\frac{3}{4}$ ✓

15



Not to scale

What is the value of $\sin\theta$?

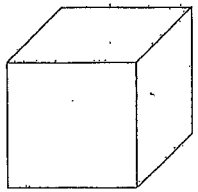
$\sin\theta = \frac{3}{5}$ ✓

16 Complete the table below, using the rule $y = 3x - 2$.

x	7	2	4
y	19	4	10

✓

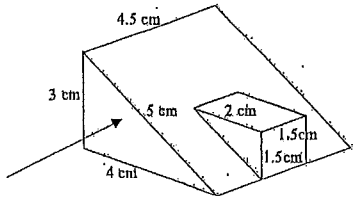
17 A cube has a surface area of 54 cm^2. Calculate the length of each edge of this cube.

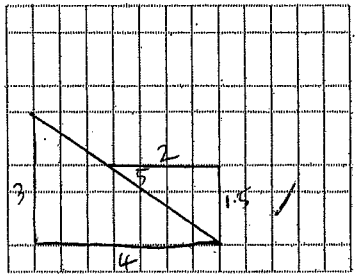


$54 \div 6$
$= 9\ cm^2$/side
$3 \times 3 = 9$ ✓

∴ length of edge is 3 ✓

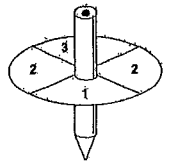
18 What is the view of this solid from the direction of the arrow?





✓

19 A spinner is divided into four equal sections. The sections are labelled using the digits 1, 2 and 3.



Kelly makes the statement.

'The spinner is equally likely to stop on an even number.'

Explain Kelly's statement.

This statement is true because the chance of the spinner stopping on 2 (consist of 2 equal sections) is 50% and the chance of it landing on 1 & 3 is also 50% (also consist of 2 equal sections). This is true because each section on the spinner is equal.

20 A score was added to the set of scores: 15, 18, 20, 22, 24, 26

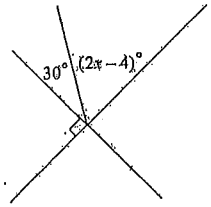
The new mean is equal to 20.

What score was added?

7×20 $140 - 125$
$= 140$ $= 15$ ✓
∴ the new score was 15. ✓

2
15
18
20
22
24
26
125 ✓

21 Find the value of x in the diagram below.



$(2x-4) + 30 = 90$
$2x - 4 = 60$
$2x = 64$
$x = 32°$ ✓

22 $(8.25\times10^7)\div(3\times10^5)=$
(Answer in scientific notation)

using Index Laws

$10^5(8.25\times10^{2}-3)$

82500000

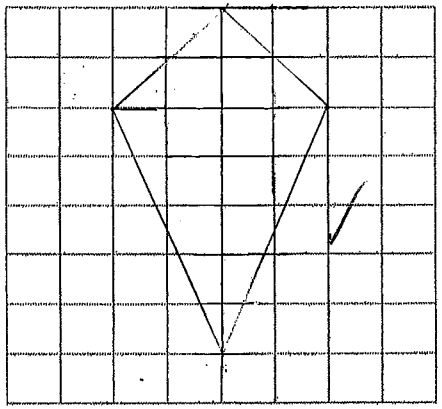
300000

$8.22000000.$

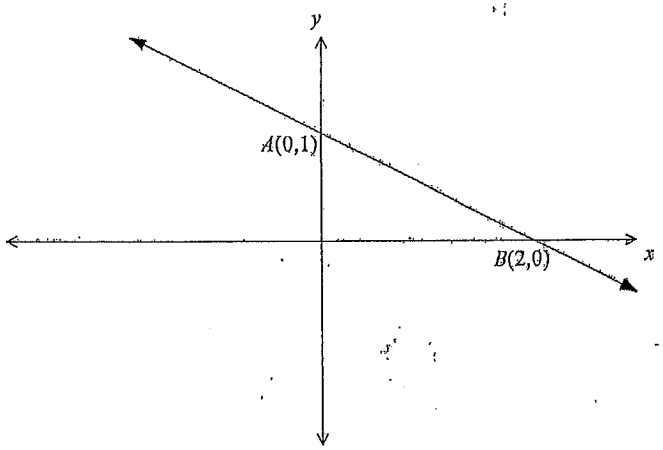
$10^5(825-3) = 822\times10^5$

$= 8.22\times10^7$ ✓

23 In the grid below draw a kite with an area of 14 cm^2.



24 A line passes through the points $A(0,1)$ and $B(2,0)$.

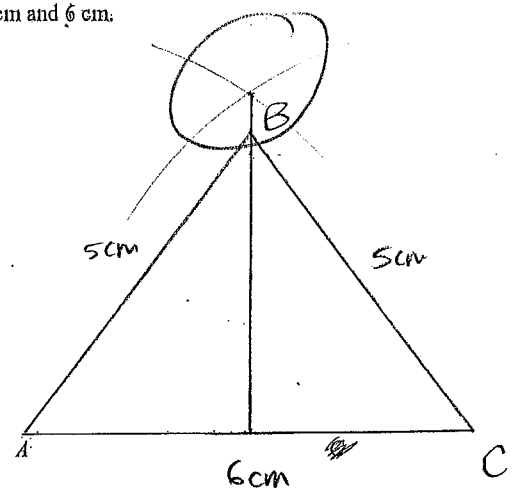


Find the equation of the line AB.

$y=-\frac{x}{2}+1$

$2y=-x+2 \Rightarrow x+2y-2=0$

25 Use your instruments to construct an isosceles triangle $\triangle ABC$ with side lengths of 5 cm, 5 cm and 6 cm.



2007 Trial School Certificate Test

Mathematics

Section 2

75 marks
Time allowed for this section is
1 hour and 30 minutes

This section has TWO parts

Part A – Questions 26–80 55 marks
Part B – Questions 81–84 20 marks

Calculators may be used in this section

Do not commence Section 2 until you are instructed to do so

Part A

Questions 26–80 55 marks

Use the Section 2 – Part A – Answer Sheet for Questions 26–80

Instructions for answering multiple-choice questions

- For Questions 26–75, select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

  Sample: $2 + 4 =$ (A) 2 (B) 6 (C) 8 (D) 9

  A ○ B ● C ○ D ○

- If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

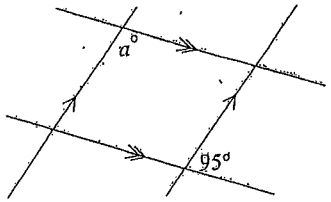
  A ● B ⊗ C ○ D ○

- If you change your mind and have crossed out what you consider to be the correct answer, then indicate the correct answer by writing the word correct and drawing an arrow as follows.

  correct ↙

  A ● B ⊗ C ○ D ○

26 Anne was required to find the value of a.



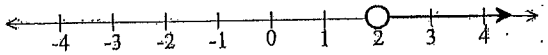
She started with 95° and in two steps correctly found the value of a. Which types of angles could Anne have used?

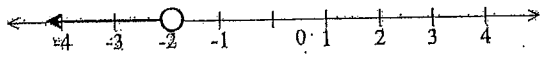
(A) Alternate and co-interior angles
(B) Corresponding and alternate angles
(C) Alternate and corresponding angles
(D) Co-interior and vertically opposite angles

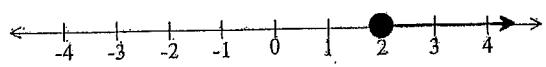
27 If $950\,000 = 9.5 \times 10^n$, the value of n is

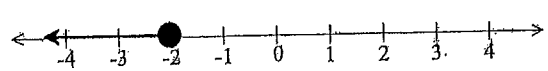
(A) -5
(B) -4
(C) 4
(D) 5

28 The graph that illustrates the solution of $-4x > 8$ is $x < -2$

(A)


(B)


(C)


(D)


29 Kayla works for three hours at 'time and a half'. She earns $72.00. Find her normal hourly rate.

$3 \times 1.5x = 72$
$4.5x = 72$
$x = 16$

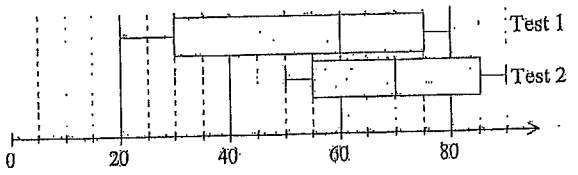
(A) $16.00
(B) $24.00
(C) $36.00
(D) $324.00

30 A house contains four girls, three boys and two adults. If one person is chosen at random, what is the probability that the person is girl?

G G G G B B B A A

(A) $\frac{1}{4}$
(B) $\frac{4}{9}$
(C) $\frac{1}{2}$
(D) $\frac{4}{5}$

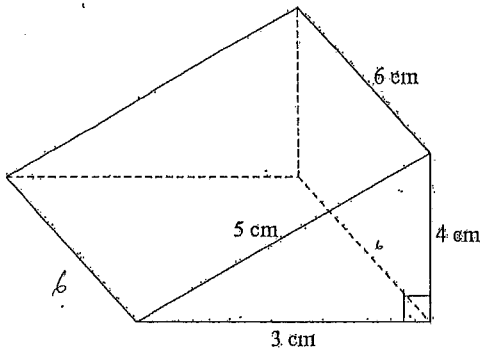
31 The results of two Mathematics tests are displayed in the following box-and-whisker plot.



Which of the following statements is correct?

(A) Lowest score for Test 1 is 30
(B) Highest score for Test 2 is 85
(C) Median for Test 1 is 50
(D) Range for Test 2 is 40

32



Not to scale

The volume of this triangular prism is

✓ (A) 36 cm³

(B) 60 cm³

(C) 72 cm³

(D) 120 cm³

---

33 Ryan invested $800 at 7% per annum. The simple interest earned between 30 September and 1 January is (3 months).

(A) $4.67

(B) $14.00

(C) $18.67

(D) $56.00

$56 / year ÷ 4 = $14

---

34 $5x-4(x-2)=$

(A) $x+2$

(B) $x-2$

(C) $x-8$

✓ (D) $x+8$

$5x-4x+8 = x+8$

---

35 A plane left at 10.15 pm and arrived at its destination at 2.35 pm the next day. How long did it take for the journey?

(A) 4 hours 20 minutes

(B) 7 hours 40 minutes

✓ (C) 16 hours 20 minutes

(D) 19 hours 40 minutes

---

36 Which two temperatures are closest to each other?

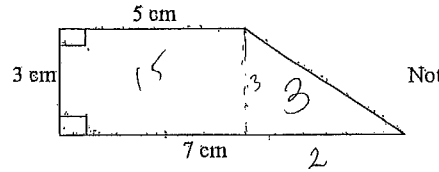
✓ (A) −7°C and −4°C

(B) −3°C and 4°C

(C) 3°C and 7°C

(D) −4°C and 4°C

37



Not to scale

The area of this figure is

✓ (A) 18 cm²

(B) 21 cm²

(C) 27 cm²

(D) 35 cm²

---

38 The number 0.000 635 written in scientific notation is

✓ (A) 6.35×10^{-4}

(B) 6.35×10^{4}

(C) 6.35×10^{-5}

(D) 6.35×10^{5}

---

39 An energy company's charges for gas over a three-month period are shown in the table below.

First 750 MJ	1.3920 cents per MJ
Additional MJ over 750	1.3330 cents per MJ

The Sanderson's used 2500 MJ of gas in this period. The total cost of this gas is

(A) $20.44
(B) $33.33
(C) $33.77
(D) $41.54

1044
+ 2332.75
3376.75

40 Given $v = u + at$ and $v = 25$, a correct set of values for u, a and t is

(A) $u = -5,\ a = 10,\ t = 3$
(B) $u = -5,\ a = 10,\ t = -3$
(C) $u = 5,\ a = -10,\ t = 3$
(D) $u = 5,\ a = -10,\ t = -3$

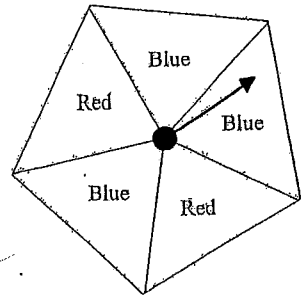
41 Kara scored 90, 49, 90, 75, 65 and 56 in her Trial SC exams. Which of the following measures would Kara prefer to tell her parents?

425

(A) Mean 70.83
(B) Mode 90
(C) Median
(D) Range

42 The arrow on this regular pentagon is spun 300 times. Each result is recorded as blue or red. If the probability of each result is equal, which of the following is most likely

(A) 150 blue and 150 red
(B) 175 blue and 125 red
(C) 200 blue and 100 red
(D) 160 blue and 140 red



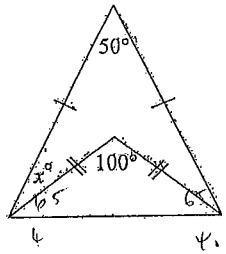
2/5 2/5
180 120

43 If $x = 16$, what is the value of $4x^{1/2}$

(A) 8
(B) 16
(C) 32
(D) 64

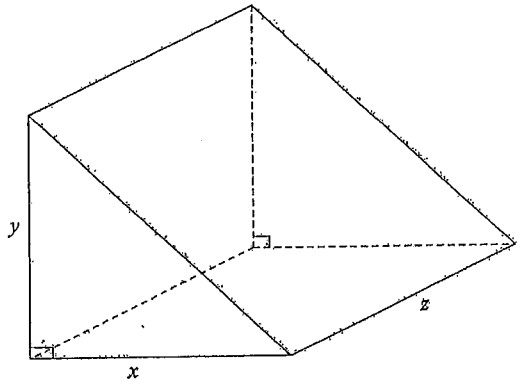
44 The value of x is

(A) 25°
(B) 50°
(C) 75°
(D) 100°



Not to scale

45



The diagram shows a triangular prism with a base edge of x cm, a triangular height of y cm and a width of z cm. What is the volume of the prism in cubic centimetres?

(A) $x + y + z$
(B) $x^2 + y^2$
(C) xyz
(D) $\frac{xyz}{2}$

46 Benjamin takes out a loan of $40 000 over a term of five years.

Monthly repayments

Amount of loan	Term of loan		
	3 years	4 years	5 years
$10 000	$355	$289	$251
$20 000	$710	$577	$501
$30 000	$1064	$866	$752
$40 000	$1419	$1155	$1002
$50 000	$1774	$1444	$1253

How much interest will Benjamin pay over the term of the loan?

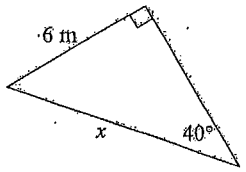
(A) $1002
(B) $5010
(C) $20 120
(D) $60 120

47 Jasmine is booked to leave on an overseas flight on 3 July. She must pay her fare at least 15 days before departure. What is the date of the last day on which she can pay her fare?

(A) 17 June
(B) 18 June
(C) 19 June
(D) 20 June

48 The value of x is

(A) $6\tan 40$
(B) $\dfrac{6}{\tan 40}$
(C) $6\sin 40$
(D) $\dfrac{6}{\sin 40}$



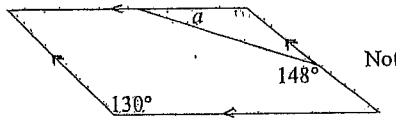
49 $\dfrac{x^2}{4}+\dfrac{2x^2}{7}=$

(A) $\dfrac{3x^2}{28}$
(B) $\dfrac{3x^2}{11}$
(C) $\dfrac{15x^2}{28}$
(D) $\dfrac{15x^2}{11}$

50 The figure is a parallelogram.

What is the value of angle a?

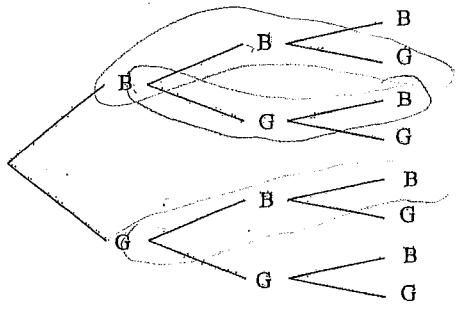
(A) 18
(B) 42
(C) 74
(D) 88



Not to scale

51 The tree diagram shows all possible combinations for families with three children. The probability of a three-child family consisting of two boys and one girl is

(A) $\dfrac{1}{8}$
(B) $\dfrac{1}{4}$
(C) $\dfrac{3}{8}$
(D) $\dfrac{2}{3}$



52 What is the correct rule for this table of values?

x	-3	-2	-1	0	1	2	3
y	-5	-3	-1	1	3	5	7

(A) $y = x + 3$

(B) $y = 2x + 1$

(C) $y = 2x - 1$

(D) $y = x + 1$

53 The results of a speed camera on Green Road are recorded below.

Over the speed limit (km/h)	Class centre	Number of cars
1–5	3	40
6–10	8	25
11–15	13	20
16–20	18	10
21–25	23	5

What is the mean over the speed limit for this data?

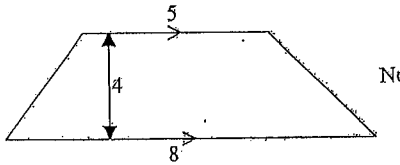
(A) 8 km/h

(B) 8.25 km/h

(C) 8.75 km/h

(D) 13 km/h

54



Not to scale

The dimensions of this figure are in metres. What is the area?

(A) 26 m^2

(B) 40 m^2

(C) 64 m^2

(D) 160 m^2

55 Isabella decides to buy a car for \$24 000. She has saved \$6000 for the deposit and takes out a loan over two years for the balance. The flat rate of interest charged is 12% per annum. The total amount of interest to be paid is

(A) \$1440

(B) \$2160

(C) \$4320

(D) \$5760

56 The midpoint of the interval joining $(7, 5)$ and $(-9, 1)$

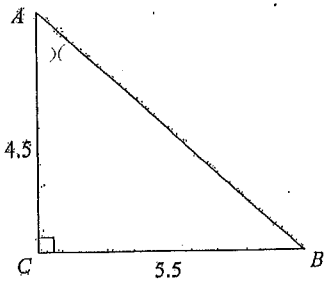
(A) $(-1, 2)$

(B) $(-1, 3)$

(C) $(-2, 4)$

(D) $(8, 2)$

57



Not to scale

What is the size of angle CAB to the nearest degree?

(A) 39

(B) 42

(C) 48

(D) 51

58 Use your calculator to evaluate $\dfrac{\sqrt{5}-1}{2\sqrt{2}}$ correct to 2 decimal places.

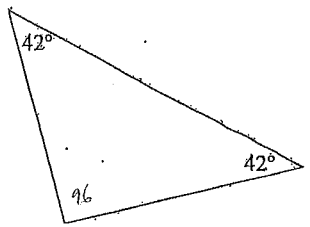
(A) 0.44

(B) 0.87

(C) 1.52

(D) 1.53

59



Not to scale

The diagram represents a triangle which is

(A) obtuse angled and isosceles

(B) obtuse angled and scalene

(C) acute angled and isosceles

(D) acute angled and scalene

60 Which expression has $x+5$ as a factor?

(A) $5x+10$

(B) x^2+25

(C) x^2+5x

(D) $5x^2+25$

61 David chooses one ball at random from his golf bag. What is the probability of him *not* choosing a 'Maxfli'?

Type of golf ball	Quantity
B51 Impact	3
Maxfli	5
Pinnacle	13

(A) $\frac{1}{5}$

(B) $\frac{5}{21}$

(C) $\frac{1}{3}$

(D) $\frac{16}{21}$

62 In Gibson Avenue there are three high school students, four primary school students and five preschool students. One student from Gibson Avenue is chosen at random. What is the probability that a primary school student is chosen?

(A) $\frac{1}{12}$

(B) $\frac{1}{3}$

(C) $\frac{1}{2}$

(D) $\frac{2}{3}$

63 $12x^6+4x^3=$

(A) $3x^3$

(B) $8x^3$

(C) $3x^2$

(D) $8x^2$

64 Washing machine concentrate is sold in four different sizes. Which represents the best buy?

(A) 1.5 kg for \$7.40

(B) 2 kg for \$8.60

(C) 2.5 kg for \$11.10

(D) 3 kg for \$13.50

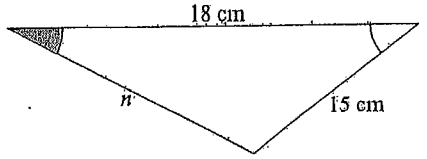
65 In the diagram

(A) $m=6$ cm, $n=9$ cm

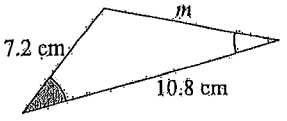
(B) $m=7$ cm, $n=10$ cm

(C) $m=8$ cm, $n=11$ cm

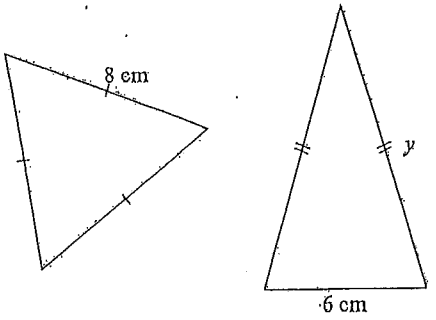
(D) $m=9$ cm, $n=12$ cm



Not to scale



66



Not to scale

The above triangles have the same perimeter. What is the value of y in centimetres?

(A) 6
(B) 8
✓ (C) 9
(D) 10

---

67 $2^3 \times 3^2 =$

(A) 5×5
✓ (B) 8×9
(C) 5^5
(D) 6^6

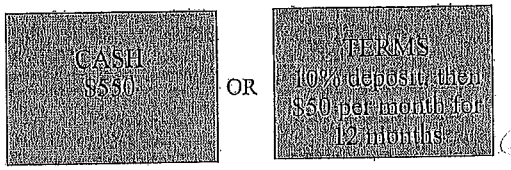
---

68 If m is an even number then the next largest even number is

(A) $m+1$
✓ (B) $m+2$
(C) $2m+1$
(D) $3m$

---

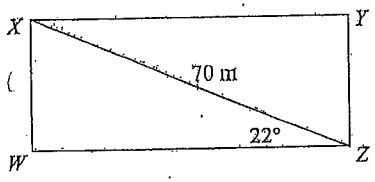
69 A lawn mower is advertised in this way.



John is considering paying cash or buying on terms. How much extra is paid by buying on terms?

(A) $55
✓ (B) $105
(C) $600
(D) $655

70



Not to scale

The diagram represents a rectangular block of land. The diagonal of the block is 70 metres long. The angle the diagonal makes with the side WZ is 22 degrees. The length of XW to the nearest metre is

✓ (A) 26
(B) 27
(C) 28
(D) 29

$\sin 22^\circ = \frac{x}{70}$

$x = 70\sin 22^\circ$

---

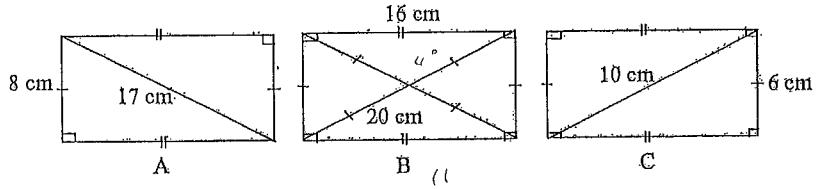
71 The following frequency table shows the results of a test out of 20.

Score (x)	Freq (f)	fx
13	9	117
14	3	42
15	4	60
16	1	16
17	1	17

The mean of this data to the nearest whole number is

(A) 13
(B) 14
(C) 15
(D) 16

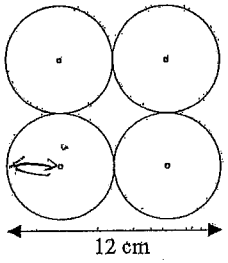
72



Which of the following statements is correct?

(A) Rectangle A is similar to rectangle C
(B) Rectangle A is similar to rectangle B
(C) Rectangle B is similar to rectangle C
(D) Rectangle A, B and C are similar

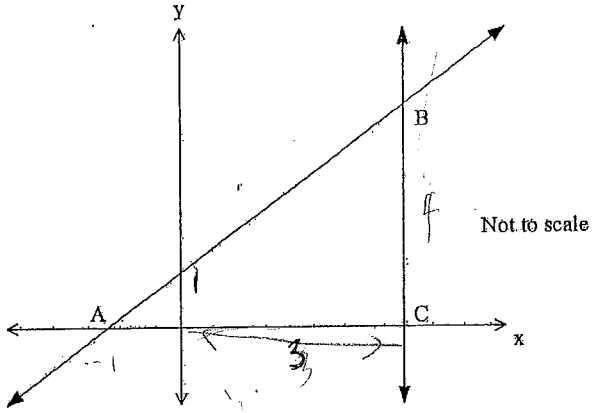
73 Four circles of the same size are used to create the shape below.



The circumference of the four circles is

(A) 12π
(B) 24π
(C) 48π
(D) 96π

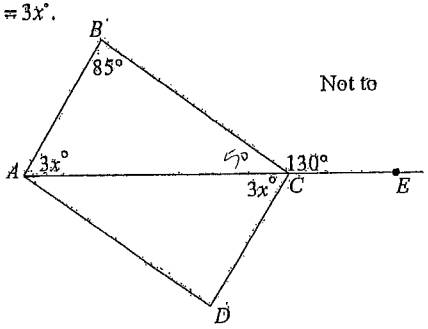
74 Line AB $(y = x+1)$ and line BC $(x = 3)$ are drawn below.



The area of $\triangle ABC$, in square units, is

(A) 4
(B) 8
(C) 9
(D) 16

75 The diagram shows quadrilateral $ABCD$ with $\angle ABC = 85°$, $\angle BCE = 130°$ and $\angle BAC = \angle ACD = 3x°$.



What is the value of x?

(A) 10
(B) 15
(C) 30
(D) 43

Instructions for Questions 76–80

- Questions 76–80 contain options A, B, C or D. Each option may be Correct or Incorrect. In each question, one, two, three or four options may be Correct.
- For Questions 76–80, fill in the response ovals on the Section 2 – Part A – Answer Sheet to indicate whether options A, B, C or D are Correct or Incorrect. You must fill in either the Correct or the Incorrect response oval for each option.

				Correct	Incorrect
Sample:	A	$2+4=4+2$	A	●	○
	B	$2-4=4-2$	B	○	●
	C	$2\times 4=4\times 2$	C	●	○
	D	$2\div 4=4\div 2$	D	○	●

- If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

	Correct	Incorrect
A	●	●

- If you change your mind and have crossed out what you consider to be the correct answer, then indicate the correct answer by writing the word answer and drawing an arrow as follows.

answer

	Correct	Incorrect
A	●	●

76 $2\left(\frac{8x}{2}\right)^0 =$

Indicate whether each of the following is correct or incorrect.

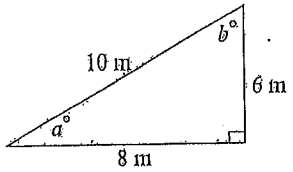
(A) 2

(B) $8x$

✓ (C) $2(4x)^0$

(D) 1

77



Indicate whether each of the following is correct or incorrect.

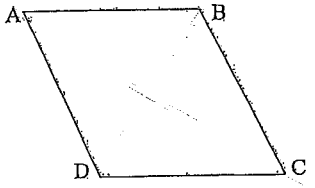
(A) $\cos b = \frac{6}{10}$

(B) $\tan b = \frac{6}{8}$

✓ (C) $\sin a = \frac{8}{10}$

(D) $\cos a = \frac{8}{10}$

78



Which of the following statements about the diagonals of rhombus $ABCD$ are correct or incorrect?

(A) The diagonals are equal

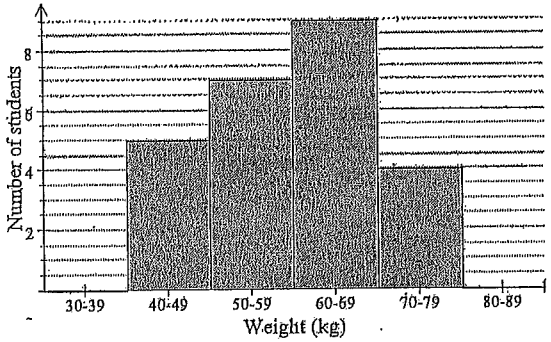
✓ (B) The diagonals bisect each other

✓ (C) The diagonals intersect at right angles

(D) The diagonals bisect the angles through which they pass.

---

79 A frequency histogram was created using the weight of 25 Year 10 students.



Indicate whether each of the following is correct or incorrect.

(A) The class centre of 40–49 kg is 44.5 kg

(B) The modal class is 60–69 kg

(C) The range is 39.

(D) The median would be below 60 kg.

---

80 If x is a number between 16 and 21 and y is a number between 4 and 9, then $\frac{x}{y}$ must be a number between the following numbers. Indicate whether each of the following is correct or incorrect.

(A) $2\frac{1}{3}$ and 4

(B) $1\frac{7}{9}$ and 10

(C) $\frac{4}{21}$ and 5

(D) $\frac{9}{16}$ and $5\frac{1}{4}$

2007 Trial School Certificate Test

Mathematics

Class

Student Number

Section 2 – Part B

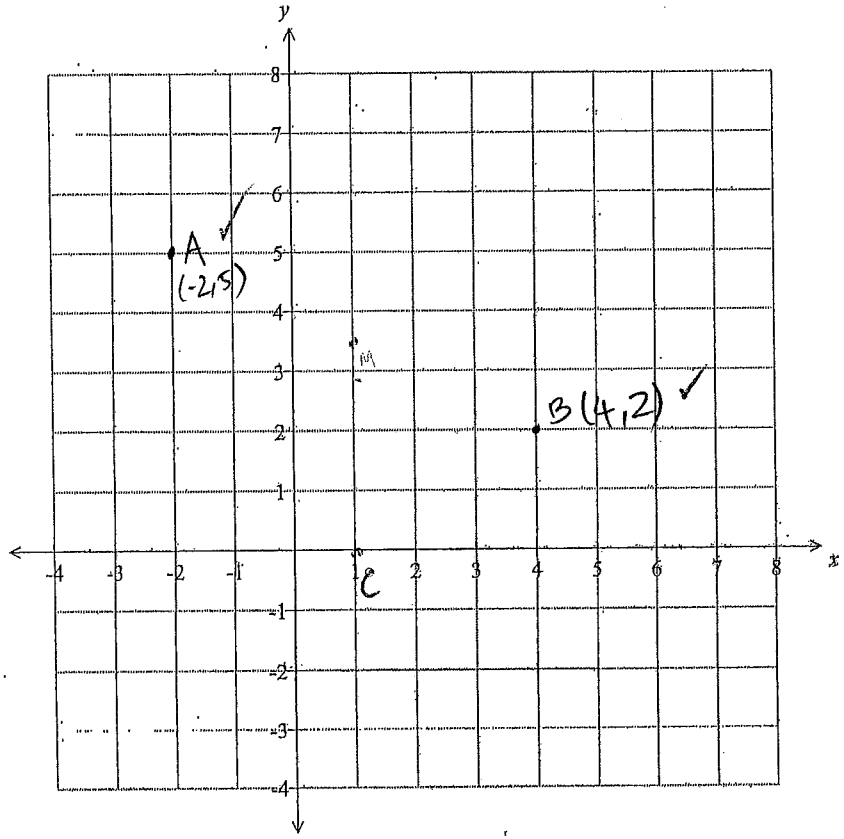
Questions 81–84 20 marks

Answer questions in the spaces provided.

Marks

Questions 81 (5 marks)

(a) On the number plane below, plot the points A (–2, 5) and B (4, 2) 1



(b) The midpoint of the interval AB is M. Find the coordinates of M. 1

$M = \left(\frac{-2+4}{2}, \frac{5+2}{2}\right)$ ✓

$= \left(\frac{2}{2}, \frac{7}{2}\right)$

$= (1, 3.5)$ ✓

(c) A line parallel to the y-axis passes through M and meets the x-axis at C. 1

What is the equation of this line?

$x = 1$ ✓

(d) Find the area of $\triangle MCB$ to the nearest square unit. 2

$A = \frac{1}{2}bh$

$b = 3.5$ ✓

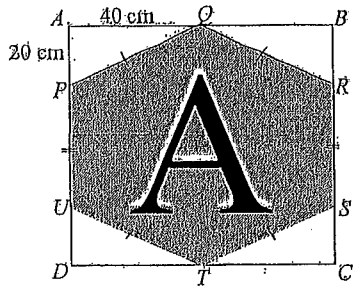
$h = 3$

$\therefore A = \frac{1}{2} \times 3.5 \times 3$ ✓

$= 5.25$ unit^2

End of Question 81

Questions 82 (5 marks)



Not to scale

(a) A hexagonal sign is made by cutting four congruent triangles from a square. 1
Calculate the area of one of the triangles.

$A = \frac{20 \times 40}{2}$ ✓

$= \frac{80}{2}$ ✓

$= 40\ cm^2$ ✓

(b) What is the area of the square *ABCD* ? 1

$AB = 80$

80^2 ✓

$= 6400\ cm^2$ ✓

(c) Calculate the area of the hexagonal sign *PQRSTU*? 1

$A = 6400 - (4 \times 40)$

$= 6400 - 160$

$= 6240\ cm^2$ ✓

(d) Use Pythagoras's theorem to calculate the length of the side *PQ*. 1
Give your answer correct to the nearest centimetre.

$20^2 + 40^2 = x^2$ ✓

$x^2 = 2000$

$x = 44.72135...$

$= 45\ cm$ ✓ (nearest cm)

(e) Calculate the perimeter of the hexagon *PQRSTU*. 1
Give your answer correct to the nearest centimetre.

$(44.72135 \times 4) + (40 \times 2)$

$= 258.8854$

$= 259\ cm$ ✓ (nearest cm)

End of Question 82

Marks

Questions 83 (5 marks)

Daniel works in a shop and earns $21.60 per hour at the normal rate. Each week he works 15 hours at the normal rate and 4 hours at time-and-a-half each week. 1

(a) Calculate Daniel's weekly wage.

$(15 \times 21.6) + (4 \times 1.5 \times 21.6)$ ✓

$= \$453.60$ ✓

(b) Daniel aims to increase his weekly wage to $540 by working extra hours at the normal rate. How many extra hours must Daniel work? 1

$540 - 453.6$ ✓

$= \$86.4$

$86.4 \div 21.6$

$= 4$

∴ he will have to work an extra 4 hours ✓

(c) Daniel's rate of pay increased by 5%. What is his new hourly rate for normal hours? 1

1.05×21.6 ✓

$= \$22.68$ ✓

(d) Daniel has saved $6000 to buy a new car. He has decided to invest the $6000 in a term deposit for three years at 8% p.a. compounding annually. How much interest will Daniel earn in this account? Give answer to the nearest cent. 2

$A = 6000(1 + 0.08)^3$ ✓

$= \$7558.272$

$= \$7558.30$ ✓

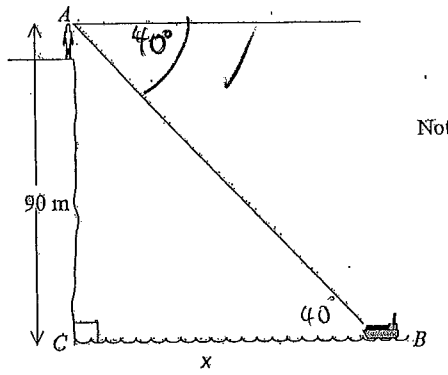
End of Question 83

Marks

Questions 84 (5 marks)

Cathy is standing on a vertical cliff and observing a ship out to sea.

She is 90 metres above sea level



Not to scale

The angle of depression of the ship, B, from A is 40°.

(a) Label the angle of depression on the diagram above. 1

(b) Calculate the distance the ship is out to sea, x, to the nearest metre. 1

$\tan 40° = \frac{90}{x}$ ✓

$x = \frac{90}{\tan 40°}$

$x = 107.2578\ldots$

∴ $x = 107$ m (nearest m) ✓

(c) The ship is travelling out to sea at a speed of 18 km/h. How far will the ship be out to sea after 1 minute? Give your answer to the nearest metre. **2**

18 km/h ✓

0.3 km/min

∴ the ship will be 300m out to sea. ✓

(d) Cathy estimates the angle of depression of the ship, B, from A after 1 minute to be less than 15°. **1**

Do you agree with Cathy's estimation? Justify your answer, showing mathematical calculations.

$107.25782 + 300$

$= 407.25782$ ✓

$\tan x^\circ = \frac{90}{407.25782}$

$x^\circ = 12.46152\ldots$ ✓

The angle of depression after 1 min will be 12° (nearest degree)

and is less than 15° ✓

End of Question 84

End of Paper