

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

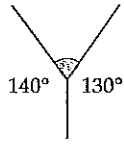
- If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

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.

A B C D
correct ↖

26



NOT TO SCALE

What type of angle is the shaded angle?

- (A) Acute (B) Obtuse (C) Reflex (D) Right

27 Consider the table of values.

x	1	2	3	4
y	3	7	11	15

What rule describes the pattern?

- (A) $y = x + 4$ (B) $y = 4x - 1$ (C) $y = 2x + 1$ (D) $y = 3x + 1$

28 Lily pays the following mobile phone fees:

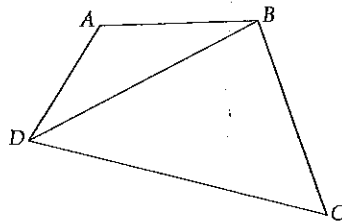
- 22 cents connection fee per call
- 15 cents per 30 seconds.

Lily makes a 3 minute call.

How much will she be charged?

- (A) \$0.67 (B) \$0.81 (C) \$0.90 (D) \$1.12

29 What name is given to BD in the diagram?



- (A) Chord (B) Diagonal (C) Diameter (D) Hypotenuse

30 $m + m + m - n + n =$

- (A) $3m - 2n$ (B) $m^3 - n^2$ (C) m^3 (D) $3m$

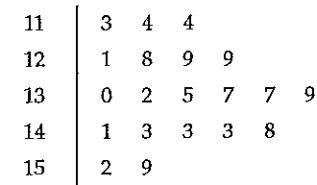
31 Stephanie was born in August 1961.

How old will she be in November 2017?

- (A) 42 (B) 43 (C) 56 (D) 57

Use the following information to answer Questions 32 and 33.

The stem-and-leaf plot shows the number of people who enter a coffee shop each day.



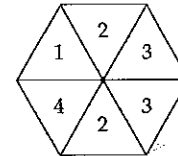
32 How many more people entered the coffee shop on the busiest day compared with the least busy day?

- (A) 4 (B) 6 (C) 39 (D) 46

33 What is the term for the value asked for in Question 32?

- (A) Range (B) Mode (C) Median (D) Mean

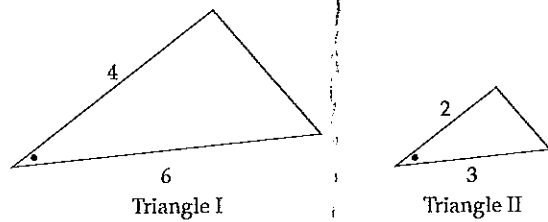
34 A spinner is numbered as shown.



What is the probability of spinning a 3?

- (A) $\frac{1}{6}$ (B) $\frac{1}{4}$ (C) $\frac{1}{3}$ (D) $\frac{1}{2}$

- 35 Triangle II has been drawn to be similar to Triangle I.



What is the scale factor?

- (A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) $\frac{3}{2}$ (D) 2
-
- 36 Peter's rate of pay is \$18 per hour. When he works overtime, his rate of pay is at time-and-a-half.

What is he paid for two hours of overtime work?

- (A) \$18 (B) \$27 (C) \$36 (D) \$54
-
- 37 Two divided by eight is equivalent to which of the following?

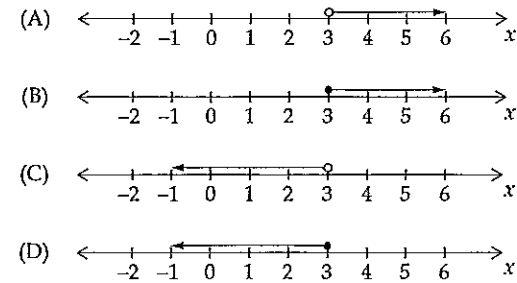
- (A) $2 + \frac{1}{8}$ (B) $2 \times \frac{1}{8}$ (C) $8 \div 2$ (D) 2×8
-

- 38 The faces on a 10-sided die are numbered 1 to 10.

What is the probability of NOT rolling a 5?

- (A) $\frac{9}{10}$ (B) $\frac{1}{2}$ (C) $\frac{1}{10}$ (D) 0
-

- 39 Which graph represents the inequality $x > 3$?



- 40 Simplify $5x^0 + 8$.

- (A) $5x + 8$ (B) 8 (C) 9 (D) 13
-

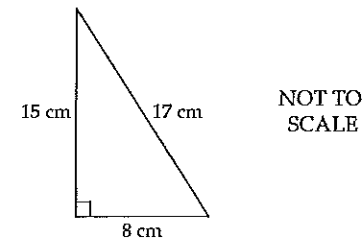
- 41 Tai and Mel received text messages in the ratio of 4:5.

They received 108 text messages altogether.

How many did Tai receive?

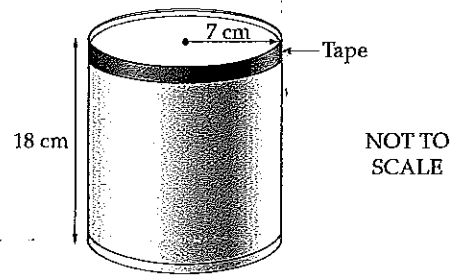
- (A) 9 (B) 12 (C) 48 (D) 60
-

- 42 What is the area of the triangle?



- (A) 40 cm^2 (B) 60 cm^2 (C) 68 cm^2 (D) 120 cm^2
-

- 43 Tape is placed around the top of a cylindrical can so that there is no overlap.

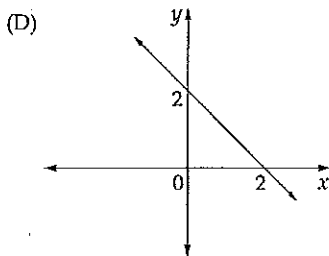
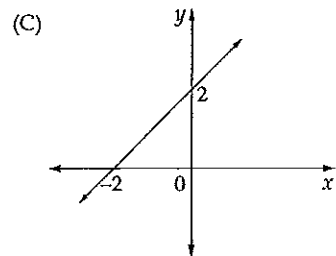
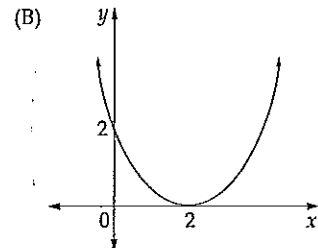
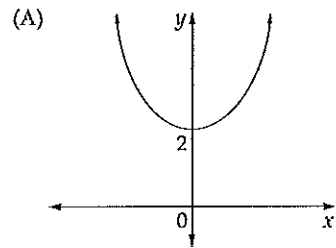


The can has a radius of 7 cm and a height of 18 cm.

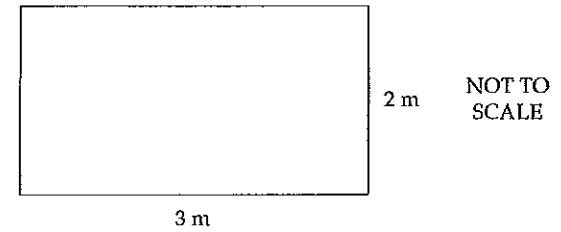
What length of tape is needed to the nearest centimetre?

- (A) 14 cm
 (B) 22 cm
 (C) 44 cm
 (D) 57 cm

- 44 Which of the following graphs corresponds to the equation $y = x^2 + 2$?



- 45



What is the area in square centimetres of the rectangle shown?

- (A) 60 (B) 600 (C) 6000 (D) 60 000

- 46 There are 15 boys in a group of 35 students.

What is the ratio of boys to girls in this group?

- (A) 3:4 (B) 4:3 (C) 4:7 (D) 3:7

- 47 A group of students was surveyed regarding their favourite type of TV show. The results are shown in the table below.

Comedy	Drama	Reality
15	13	12

A student from this group is chosen at random.

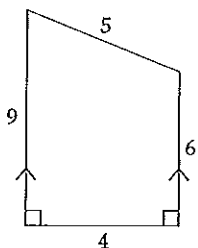
What is the probability that this student's favourite type of TV show is comedy?

- (A) $\frac{1}{3}$ (B) $\frac{3}{8}$ (C) $\frac{1}{15}$ (D) $\frac{15}{25}$

- 48 Factorise $6x + 15$.

- (A) $6(x + 15)$ (B) $6(x + 9)$ (C) $3(x + 5)$ (D) $3(2x + 5)$

49

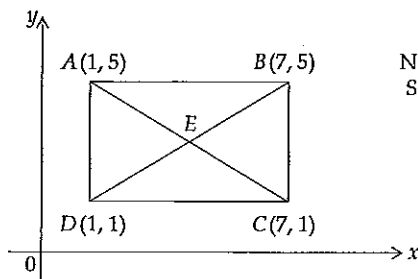


NOT TO SCALE

Which of the following expressions could be used to find the area of this trapezium?

- (A) $\frac{1}{2} \times 9(5+4)$ (B) $\frac{1}{2} \times 4(9+6)$ (C) $\frac{1}{2} \times 6(9+5)$ (D) $\frac{1}{2} \times 5(9+4)$

50



NOT TO SCALE

What are the coordinates of E in the above figure?

- (A) (4, 3) (B) (3, 4) (C) (3, 2) (D) (2, 3)

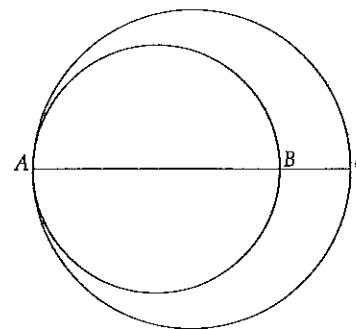
51 The table shows the 6 am temperature in Thredbo over 5 days.

Day	1	2	3	4	5
Temperature ($^{\circ}\text{C}$)	-8.4	-7.6	-7.6	-8.5	-11

What is the difference between the highest and lowest of these temperatures?

- (A) 2.6 (B) 3.4 (C) 4.6 (D) 18.6

52 The diagram shows two circles. AB is the diameter of the smaller circle with radius 6 cm. AC is the diameter of the larger circle with radius 10 cm.



NOT TO SCALE

What is the distance between B and C ?

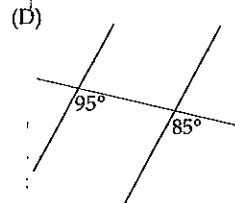
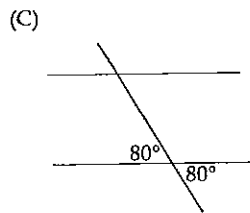
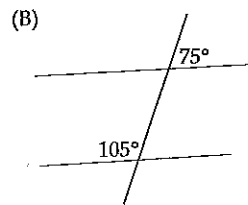
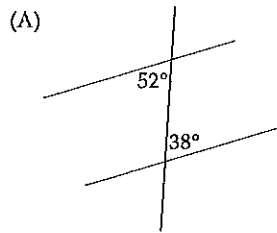
- (A) 4 cm (B) 8 cm (C) 10 cm (D) 16 cm

53 Ricky started watching a movie at 10:30 am. The movie has a running time of 138 minutes.

What time will the movie finish?

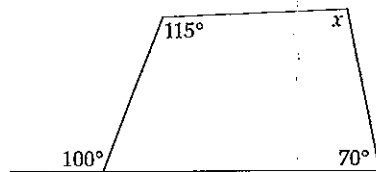
- (A) 11:08 am
 (B) 12:08 pm
 (C) 12:48 pm
 (D) 12:58 pm

54 The following diagrams show pairs of lines being cut by a transversal.
Which diagram shows a pair of lines that **MUST** be parallel?



ALL DIAGRAMS
NOT TO SCALE

55

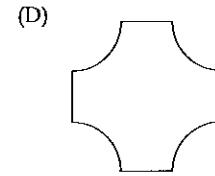
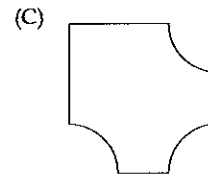
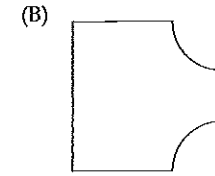
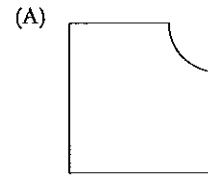


NOT TO
SCALE

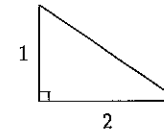
What is the value of x ?

- (A) 75° (B) 80° (C) 95° (D) 110°

56 Quadrants of the same size have been cut out of four identical squares.
Which shape has the greatest perimeter?



57 What is the exact length of the hypotenuse of this triangle?



NOT TO
SCALE

- (A) 1.7 (B) 2.2 (C) $\sqrt{3}$ (D) $\sqrt{5}$

- 58 The graph is a cumulative frequency histogram and polygon.



What is the median score?

- (A) 3 (B) 3.5 (C) 4.5 (D) 10

- 59 René lost 80% on his share investments. After a period of time his shares increased in value to their previous value.

What is this increase expressed as a percentage?

- (A) 20% (B) 80% (C) 400% (D) 500%

- 60 A full bucket holds approximately 5×10^8 grains of sand.

Jock estimates that the sand on a beach would fill 60 000 buckets.

Approximately how many grains of sand are on the beach?

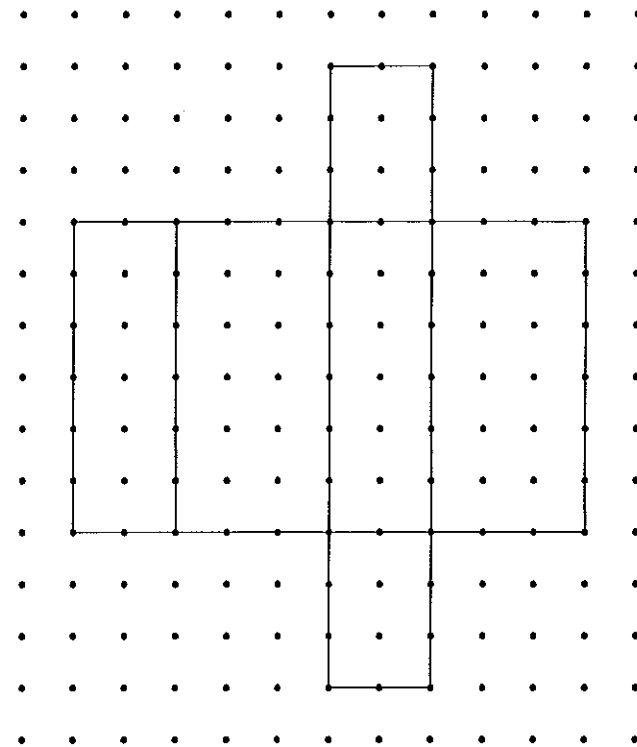
- (A) 3×10^{13}
 (B) 3×10^9
 (C) 8.3×10^3
 (D) 1.2×10^4

- 61 Oliver earns a yearly salary of \$68 720. After tax, he receives 65% of this as net pay.

What is his monthly net pay to the nearest dollar?

- (A) \$2004 (B) \$3436 (C) \$3722 (D) \$5662

- 62 The net of a box is shown on a centimetre grid.



What is the volume of the box?

- (A) 36 cm^3
 (B) 44 cm^3
 (C) 66 cm^3
 (D) 72 cm^3

63 Sam takes 3 minutes 10 seconds to walk one lap of the local park.

Walking at the same rate, how long will Sam take to walk 10 laps?

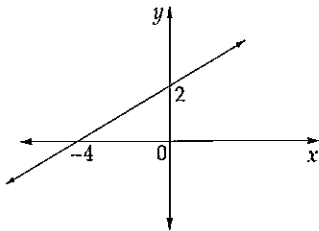
- (A) 30 minutes 10 seconds
- (B) 31 minutes
- (C) 31 minutes 40 seconds
- (D) 32 minutes

64 An item is sold for \$22.00 including 10% GST.

What is the cost before the GST is added?

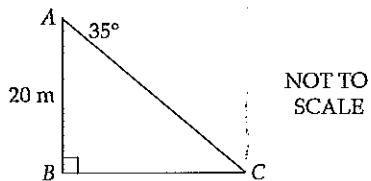
- (A) \$18
- (B) \$19.80
- (C) \$20
- (D) \$24.20

65 What is the equation of the line below?



- (A) $y = \frac{1}{2}x + 2$
- (B) $y = \frac{1}{2}x - 4$
- (C) $y = 2x + 2$
- (D) $y = 2x - 4$

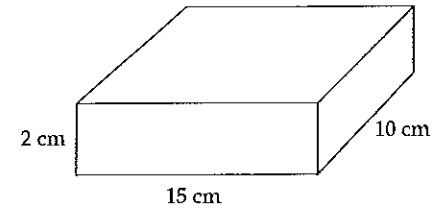
66 Bill stands on a 20 m vertical cliff at point A. He spots a swimmer at C at an angle of depression of 35° , as shown in the diagram.



How far is the swimmer from the base, B, of the cliff (correct to one decimal place)?

- (A) 11.5 m
- (B) 14.0 m
- (C) 16.4 m
- (D) 28.6 m

67 The diagram shows a closed rectangular prism.

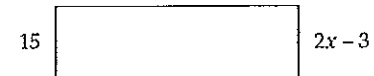


NOT TO SCALE

What is its surface area?

- (A) 200 cm^2
- (B) 250 cm^2
- (C) 300 cm^2
- (D) 400 cm^2

68 A rectangle is shown.



What is the value of x ?

- (A) 5
- (B) 6
- (C) 9
- (D) 15

69 In one particular week, Isabella works 40 hours at \$8.75 per hour, 3 hours at time-and-a-half and 4 hours at double-time.

What is her total wage for this week?

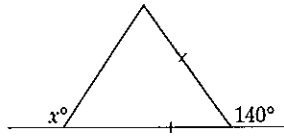
- (A) \$411.25
- (B) \$441.88
- (C) \$459.38
- (D) \$1050

70 The mean age of the three O'Reilly children is 7, and the mean age of the two Lea children is 12.

What is the mean age of the five children altogether?

- (A) 7
- (B) 9
- (C) 9.5
- (D) 12

71

NOT TO
SCALEWhat is the value of x ?

- (A) 70 (B) 110 (C) 130 (D) 140

72 Eva is x years old. Tara is 3 years older than Eva.

Which of these is an expression for Tara's age in 5 years' time?

- (A) $x+8$ (B) $5(x+3)$ (C) $x+2$ (D) $3x+5$

73 $\frac{4x}{5} + \frac{x}{3} =$

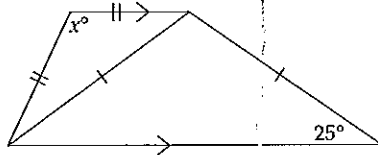
- (A) $\frac{4x^2}{8}$ (B) $\frac{5x}{8}$ (C) $\frac{17x}{15}$ (D) $\frac{23x}{15}$

74 A quadrilateral has each pair of opposite sides equal.

Which statement must be correct?

- (A) The diagonals are equal.
 (B) The diagonals bisect each other.
 (C) The diagonals are perpendicular to each other.
 (D) The diagonals bisect the angles of the quadrilateral.

75

NOT TO
SCALEWhat is the value of x ?

- (A) 130 (B) 140 (C) 150 (D) 155

Section 2 (continued)

Instructions for answering Questions 76–80

- Questions 76–80 contain options a, b, c and 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 and d are Correct or Incorrect. You must fill in either the Correct or the Incorrect response oval for each option.

		Correct	Incorrect
Sample:	a. $2+4 = 4+2$	<input checked="" type="radio"/>	<input type="radio"/>
	b. $2-4 = 4-2$	<input type="radio"/>	<input checked="" type="radio"/>
	c. $2 \times 4 = 4 \times 2$	<input checked="" type="radio"/>	<input type="radio"/>
	d. $2+4 = 4+2$	<input type="radio"/>	<input checked="" type="radio"/>

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

Correct Incorrect

- a.

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

- a.
- Correct Incorrect
- answer* ↙

76 Indicate whether each of the following equations is correct or incorrect.

- a. $2 + 6 \times 3 = 20$
- b. $2 \times (1 + 3^2) = 20$
- c. $\frac{8 + 12}{4 - 3} = 20$
- d. $15 + 25 + 2 = 20$

77 Sacha needs to choose a quadrilateral with perpendicular diagonals.

Indicate whether Sacha's choice of each of these quadrilaterals would be correct or incorrect.

- a. Kite
- b. Rectangle
- c. Rhombus
- d. Square

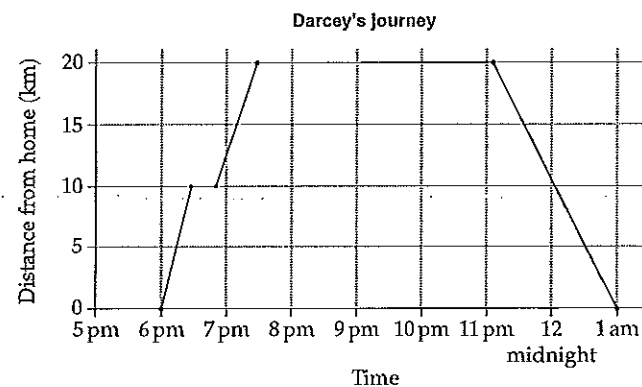
78 Indicate whether each of the following equations is correct or incorrect.

- a. $(a + a)^2 = 4a^2$
- b. $4a \times 4a = 4a^2$
- c. $(a + a + a + a)^2 = 4a^2$
- d. $a^2 + a^2 + a^2 + a^2 = 4a^2$

Please turn over

79 The graph shows Darcey's journey to his Year 10 formal, and back to his home.

Darcey arrived at the formal at 7.30 pm.



Indicate whether each of the following statements is correct or incorrect.

- a. The formal was 20 km from home.
- b. He left home at 5 pm to go to the formal.
- c. He did not stop on the way to the formal.
- d. He was at the formal for more than 3 hours.

80 Indicate whether each statement is correct or incorrect for all values of a and b .

- a. If $a^2 = b^2$, then $a = b$
- b. If $a = b$, then $a^2 = b^2$
- c. If $a < b$, then $a^2 < b^2$
- d. If $a > b$ and $c > d$, then $a + c > b + d$

2010 School Certificate Test
Mathematics

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Centre Number

Section 2 (continued)

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Student Number

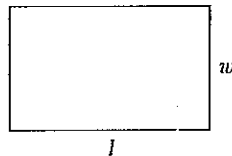
Part B

Questions 81–84 20 marks

Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.

Question 81 (5 marks)

- (a) The perimeter of a rectangle is given by $P = 2w + 2l$ where w is the width and l is the length.



The perimeter of a rectangle is 28 metres.

- (i) Find the length of the rectangle if its width is 5 metres. 1

- (ii) What is the area of the rectangle? 1

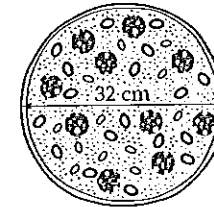
- (iii) If the perimeter remains the same and the length changes to 10 metres, what is the new width? 1

- (b) A square garden bed has a perimeter of 28 m. Fertiliser is to be put on the whole garden bed at a rate of 90 grams of fertiliser per square metre. 2
 Calculate how much fertiliser will be needed to cover the whole garden bed. All calculations must be shown.

Please turn over

Question 82 (5 marks)

- (a) This pizza is circular.



- (i) What is the area of the base of the pizza to the nearest square centimetre? 1

- (ii) The radius of the pizza was increased by 2 cm. 2
 By first finding the new area, what was the percentage increase in area? All calculations must be shown.

- (b) Kim saw the following advertisement. 2

SPECIAL!	
4 Pizzas + delivery	\$62
2 Pizzas + delivery	\$34
Delivery is a fixed charge.	

Assuming each pizza costs the same without delivery, calculate the fixed delivery charge.

2010 School Certificate Test
Mathematics

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Centre Number

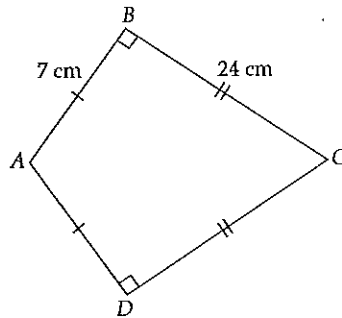
Section 2 – Part B (continued)

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Student Number

Question 83 (5 marks)

The quadrilateral $ABCD$ has two pairs of adjacent sides equal as shown, and $\angle ABC = \angle ADC = 90^\circ$.



NOT TO SCALE

- (a) What type of quadrilateral is $ABCD$? 1
.....
- (b) What is the perimeter of $ABCD$? 1
.....
- (c) (i) Calculate the area of $\triangle ABC$. 1
.....
.....
- (ii) By first showing that the length of $AC = 25$ cm, calculate the length of BD . 2
.....
.....

Please turn over

Question 84 (5 marks)

A bike has 18 gears. As the gear increases so does the number of rear wheel turns as shown in the table.

gear (g)	1	2	3	4	5	10
rear wheel turns (t)	1.3	1.6	1.9	2.2	2.5	

- (a) Complete the table. 1
- (b) Complete an equation to represent the relationship between the gears and the number of wheel turns. 2

$$t = g \times \dots + \dots$$

- (c) There is not a gear that gives exactly 6 rear wheel turns. 2

Explain, using calculations and words, why this statement is true.

.....

End of test