

Name: _____

Class: _____

St George Girls High School

Year 10



Mathematics

Common Test # 2

August 2006

Time Allowed: 65 minutes

Instructions

- Calculators may be used.

Section A: - Multiple Choice.

- Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely on the Answer Sheet.
- Where indicated, a question may have more than one acceptable answer.

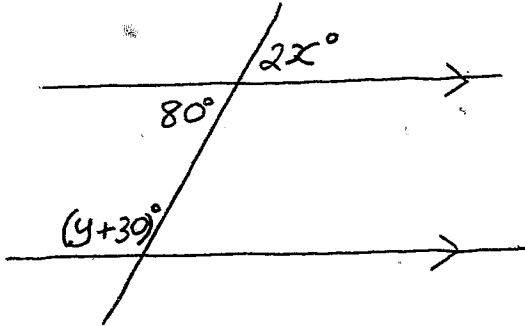
Section B: Requires answers only be shown.

Section C: All necessary working must be shown.

Section A

Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely on the Answer Sheet.

1.



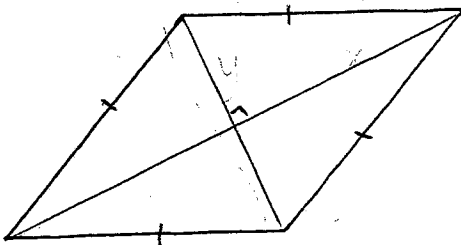
What are the values of x and y ?

- (A) $x = 40, y = 50$
- (B) $x = 40, y = 70$ ✓
- (C) $x = 80, y = 50$
- (D) $x = 80, y = 70$ ✓

2. Emma is comparing simple interest rates. Which of the following is the lowest simple interest rate?

- (A) 0.05% per day
- (B) 0.35% per week
- (C) 1.6% per month
- (D) 18.1% per year

3. A rhombus has an area of 24cm^2



not to scale

What are possible lengths of the diagonals of this rhombus?

- (A) 3cm and 4cm
- (B) 4cm and 6cm
- (C) 4cm and 12cm
- (D) 8cm and 12cm

4. Shares in MATHNET have a current value of \$1.50. At what price must they be sold to make a 20% profit.

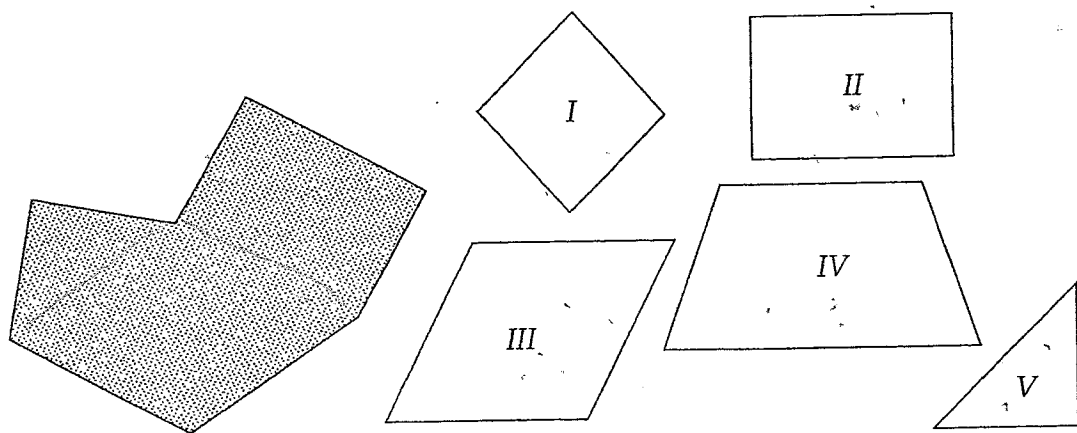
- (A) \$1.20
- (B) \$1.30
- (C) \$1.70
- (D) \$1.80

5. Sabrina bought a dress that was reduced in price to \$76.

Which piece of information would NOT be sufficient to calculate the money she saved off the normal price?

- (A) the amount of GST, at 10%, included in the normal price
- (B) per cent discount
- (C) normal price
- (D) change Sabrina received from \$100 ←

6. Which of the shapes can be put together to make the shaded area?



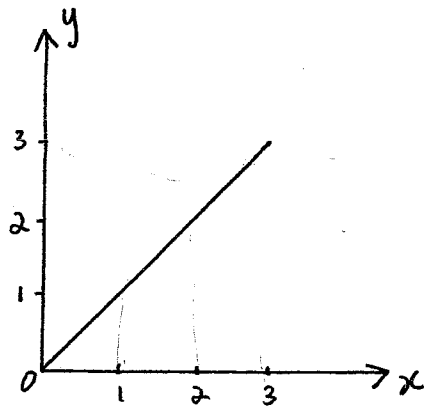
- (A) II, III, V
- (B) III, IV
- (C) II, IV
- (D) I, III, V

7. Jenny hired a taxi to travel home from work. The distance from her work to home is 21km. A hiring fee of \$2.75 was charged, plus \$1.56 per km travelled. Jenny gave the driver \$40. How much change (to the nearest 5 cents) should Jenny receive?

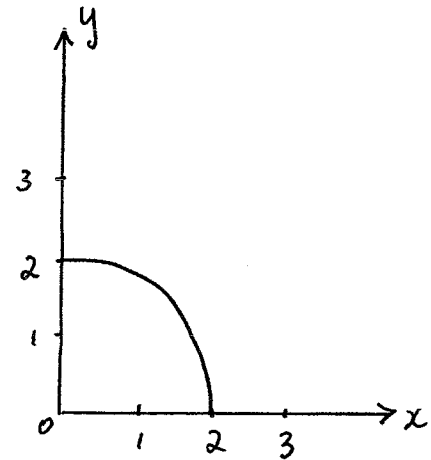
- (A) \$4.50
- (B) \$7.25
- (C) \$32.75
- (D) \$35.50

8. Which graph represents “ x is equal to 2”.

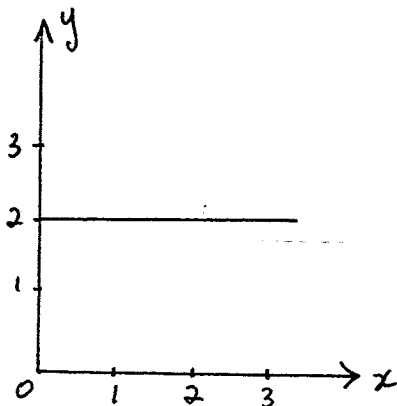
(A)



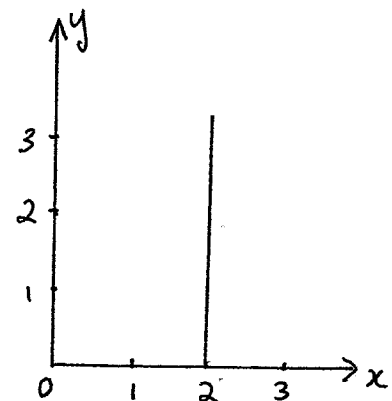
(B)



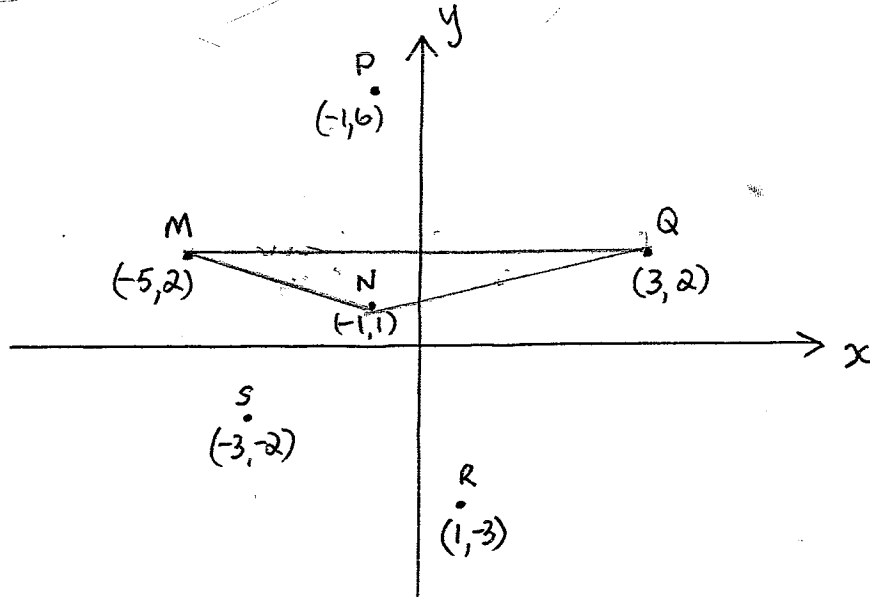
(C)



(D)



9.



MN is one side of an isosceles triangle. Which point is the other vertex of the triangle?

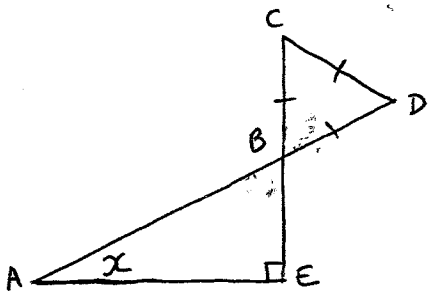
- (A) P
- (B) Q
- (C) R
- (D) S

10. The equation of a straight line is $2x + 3y - 6 = 0$ which of the following statements is true?

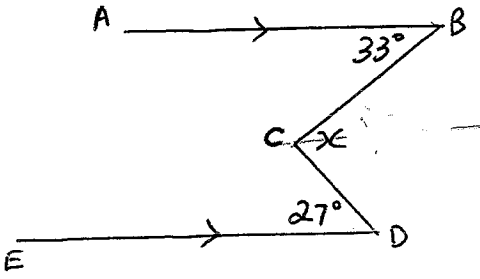
- (A) the gradient is 2; the y-intercept is -6
- (B) the gradient is $\frac{2}{3}$; the y-intercept is 6
- (C) the gradient is $-\frac{2}{3}$; the y-intercept is 2
- (D) the gradient is -2 ; the y-intercept is -3

Section B

Answers only are required.

Question	Answer
<p>11. </p> <p>Write down the value of x.</p>	
<p>12. Jill drew a figure with four equal straight sides on the chalkboard. Jack measured the diagonals and found that they also were equal. How many axes of symmetry would this figure have?</p>	
<p>13. If zero is one solution to $5x = 2x^2$ what is the other solution?</p>	
<p>14. If $(-3, b)$ lies on the line $2x - 3y - 9 = 0$ find the value of "b".</p>	
<p>15. Write the equation of a line $\frac{y+2}{x-7} = \frac{3}{4}$ in general form.</p>	
<p>16. Calculate the simple interest earned on \$8500 invested for 3.5 years at 4% p.a.</p>	

Section B (cont'd)

Question	Answer
17. Decrease \$21 650 by 14%.	
18. Find the size of an interior angle of a regular polygon with 18 sides.	
19. Find the value of x in the diagram. 	
20. Solve $\frac{w}{3} - \frac{2w}{5} = 2$	

Section C

Show all necessary working.
Marks are as shown.

Marks

Question 21 (1.6 marks)

a) Given the points $P(5, 6)$ and $Q(3, -2)$

(i) What is the gradient of the interval PQ ?

1

(ii) Show that the equation of the line l passing through the midpoint of PQ and perpendicular to PQ is $x + 4y - 12 = 0$

3

(iii) The point R lies on the line l and has coordinates $(a, 5)$. Find the value of a .

1

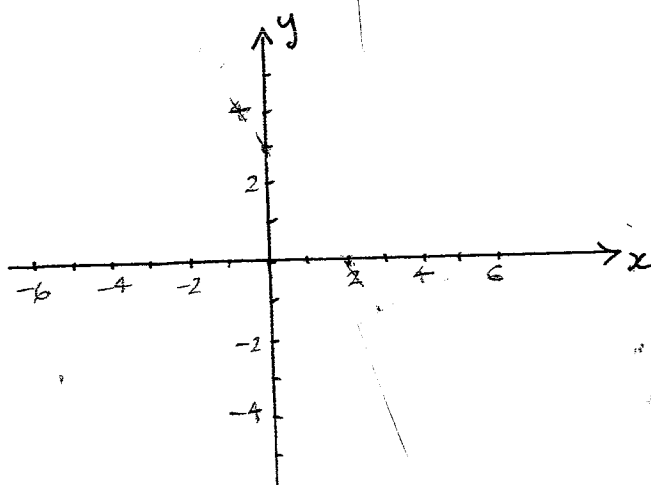
Question 21 (cont'd)

Marks

- b) If $(4,1)$ is the midpoint of the interval joining (a,b) and $(3,-6)$ find the values of a and b .

2

- c) Sketch the graph of $3x + 2y - 6 = 0$ on the axes.



- d) If $y = mx + b$ make x the subject.

2

Question 21 (cont'd)

Marks

- e) Show that the diagonals of a square with vertices $A(-2, 4)$, $B(5, 4)$, $C(5, -3)$ and $D(-2, -3)$ are equal.

2

- f) How many weeks will it take for \$50 000 to earn \$1500 in interest if the flat rate is 4% p.a.

3

Question 22 (12 marks)

Mar

- a) The table below shows the amount \$1 will grow to for various interest rates and time periods.

Accumulated value of \$1 (to four decimal places)									
Number of time periods	Interest rate								
	0.5%	1%	5%	6%	7%	8%	10%	12%	15%
1	1.0050	1.0100	1.0500	1.0600	1.0700	1.0800	1.1000	1.1200	1.1500
2	1.0100	1.0201	1.1025	1.1236	1.1449	1.1664	1.2100	1.2544	1.3225
3	1.0151	1.0303	1.1576	1.1910	1.2250	1.2597	1.3310	1.4049	1.5209
4	1.0202	1.0406	1.2155	1.2625	1.3108	1.3605	1.4641	1.5735	1.7490
5	1.0253	1.0510	1.2763	1.3382	1.4026	1.4693	1.6105	1.7623	2.0114
6	1.0304	1.0615	1.3401	1.4185	1.5007	1.5869	1.7716	1.9738	2.3131
7	1.0355	1.0721	1.4071	1.5036	1.6058	1.7138	1.9487	2.2107	2.6600
8	1.0407	1.0829	1.4775	1.5938	1.7182	1.8509	2.1436	2.4760	3.0590
9	1.0459	1.0937	1.5513	1.6895	1.8385	1.9990	2.3579	2.7731	3.5179
10	1.0511	1.1046	1.6289	1.7908	1.9672	2.1589	2.5937	3.1058	4.0456
11	1.0564	1.1157	1.7103	1.8983	2.1049	2.3316	2.8531	3.4785	4.6524
12	1.0617	1.1268	1.7959	2.0122	2.2522	2.5182	3.1384	3.8960	5.3503
18	1.0939	1.1961	2.4066	2.8543	3.3799	3.9960	5.5599	7.6900	12.3755
24	1.1272	1.2697	3.2251	4.0489	5.0724	6.3412	9.8497	15.1786	28.6252

Use the table to find:

- (i) the accumulated value when \$7500 is invested at 6% p.a. compounded annually for 8 years.

2

- (ii) the compound interest earned.

1

Question 22 (cont'd)

Mark

- b) \$12 500 is invested at a compound interest rate of 9% p.a. Interest, however is compounded monthly. Use the formula to calculate the amount to which the investment will grow in 4 years. 3
- c) If the population of Bilby Downs is decreasing by 20% of its population every year. What would be the population in 2 years if it is now 800? 2
- d) A DVD read/write player is purchased under the following terms.
- | |
|--|
| Deposit: \$110 |
| Repayments: \$41.85 each month for 2 years |
- (i) Find the total amount paid for the DVD player. 2
- (ii) If the marked price had been \$800 what percentage are the additional charges of the marked price. 2

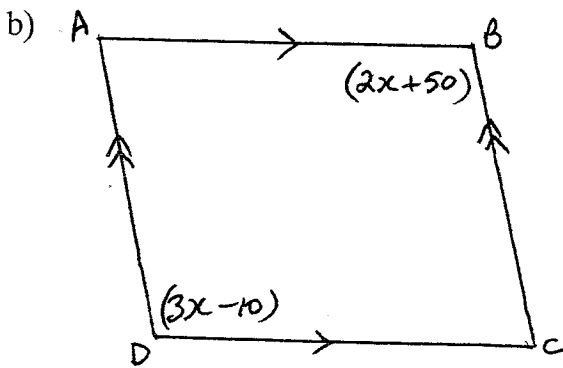
Question 23 (12 marks)

Mark

a) Use the quadratic formula to solve $3m^2 = 7 - m$

2

7



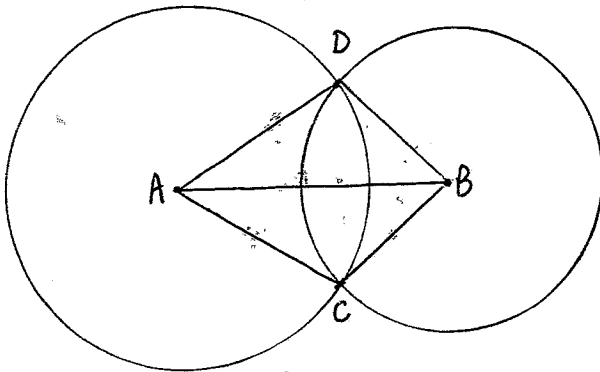
Find the value of x in (give reasons).

2

Question 23 (cont'd)

Marks

c)



A and B are the centres of two circles which intersect at C and D .

(i) Prove $\triangle ADB \equiv \triangle ACB$

3

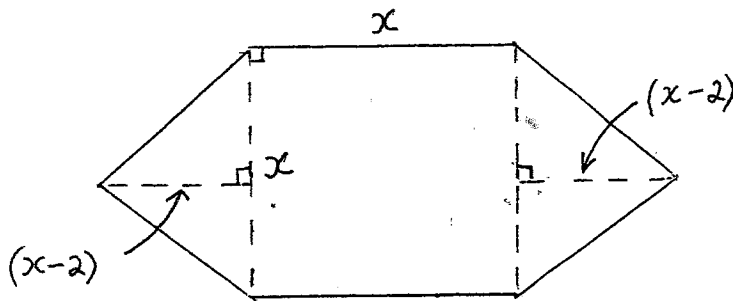
(ii) and hence prove AB bisects \widehat{DAC}

2

Question 23 (cont'd)

Marks

d)



If all dimension of this figure are in metres and the area of the shape is 60m^2 .

(i) Write an algebraic expression in x for the area.

1

(ii) Calculate the value of x .

2

100%

Student Name: Tania Ahmed (10/1)

Ms. Glissan

Section A

Multiple-choice Answer Sheet

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 this by writing the word *correct* and drawing an arrow as follows:

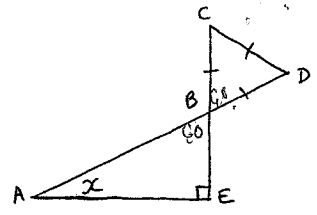
A B C D
 correct

- 1. A B C D ✓
- 2. A B C D ✓
- 3. A B C D ✓
- 4. A B C D ✓
- 5. A B C D ✓
- 6. A B C D ✓
- 7. A B C D ✓
- 8. A B C D ✓
- 9. A B C D ✓
- 10. A B C D ✓

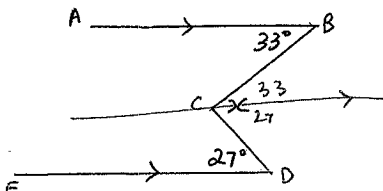
10

Section B

Answers only are required.

Question	Answer
11.  Write down the value of x.	$x = 30^\circ$ <input checked="" type="checkbox"/>
12. Jill drew a figure with four equal straight sides on the chalkboard. Jack measured the diagonals and found that they also were equal. How many axes of symmetry would this figure have?	4 <input checked="" type="checkbox"/>
13. If zero is one solution to $5x = 2x^2$ what is the other solution? $2x^2 - 5x = 0$ $x(2x - 5) = 0$ $x = 0, \frac{5}{2}$	$x = \frac{5}{2}$ <input checked="" type="checkbox"/>
14. If $(-3, b)$ lies on the line $2x - 3y - 9 = 0$ find the value of "b". $2(-3) - 3b - 9 = 0$ $-6 - 3b - 9 = 0$ $-3b = 15$ $b = -5$	$b = -5$ <input checked="" type="checkbox"/>
15. Write the equation of a line $\frac{y+2}{x-7} = \frac{3}{4}$ in general form. $4(y+2) = 3(x-7)$ $4y + 8 = 3x - 21$ $0 = 3x - 4y - 29$	$0 = 3x - 4y - 29$ <input checked="" type="checkbox"/>
16. Calculate the simple interest earned on \$8500 invested for 3.5 years at 4% p.a. $I = 8500 \times 0.04 \times 3.5$	\$ 1190 <input checked="" type="checkbox"/>

Section B (cont'd)

Question	Answer
17. Decrease \$21 650 by 14%. $= 21\ 650 \times 0.86$ $=$	\$18 619 ✓
18. Find the size of an interior angle of a regular polygon with 18 sides. $= \frac{180(n-2)}{n} = \frac{180 \times 16}{18}$	160° ✓
19. Find the value of x in the diagram. 	$x = 60^\circ$ ✓
20. Solve $\frac{w}{3} - \frac{2w}{5} = 2$ $5w - 6w = 30$ $-w = 30$ $w = -30$	$w = -30$ ✓

$$\frac{-30}{3} - \frac{(2 \times -30)}{5} = 2$$

$$-10 - -12 = 2$$

$$\frac{5 \times w}{5} - \frac{2w \times 3}{5} = 2 \times 15$$

$$5w - 6w = 30$$

$$-w = 30$$

$$w = -30$$

10

Section C

Show all necessary working.
Marks are as shown.

Question 21 (1.6 marks)

a) Given the points $P(5,6)$ and $Q(3,-2)$

(i) What is the gradient of the interval PQ?

gradient

$$m_{PQ} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(-2) - (6)}{(3) - (5)}$$

$$= \frac{-8}{-2} = 4$$

\therefore gradient of interval PQ is 4

(ii) Show that the equation of the line l passing through the midpoint of PQ and perpendicular to PQ is $x + 4y - 12 = 0$

$m_{PQ} =$ midpoint:

$$\left(\frac{5+3}{2}, \frac{6+(-2)}{2}\right) = (4, 2)$$

$$m_{PQ} = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

$$= \left(\frac{5+3}{2}, \frac{6+(-2)}{2}\right)$$

$$= (4, 2)$$

gradient:

$$y - 2 = \frac{-(x-4)}{1}$$

$$y - 2 = -x + 4$$

$$0 = x - 4y + 4 + 8$$

$$0 = x - 4y + 12$$

$$0 = x + 4y - 12$$

Equation of line:

$$y - y_1 = m(x - x_1)$$

$$y - 2 = \frac{-(x-4)}{4}$$

$$4y - 8 = -x + 4$$

$$0 = -x - 4y + 4 + 8$$

$$0 = x + 4y - 12$$

\therefore the equation of the line perpendicular to and through the midpoint of PQ is $x + 4y - 12 = 0$

(iii) The point R lies on the line l and has coordinates $(a,5)$. Find the value of a .

To find a , Sub point $(a,5)$ into $0 = x + 4y - 12$:

$$0 = x + 4y - 12$$

$$0 = a + (4 \times 5) - 12$$

$$0 = a + 8$$

$$a = -8$$

\therefore The value of a is -8

$$a + (4 \times 5) - 12$$

$$0 = (a) + (4 \times 5) - 12$$

$$0 = a + 20 - 12$$

$$0 = a + 8$$

$$a = -8$$

8

Question 21 (cont'd)

Mark

- b) If (4,1) is the midpoint of the interval joining (a,b) and (3,-6) find the values of a and b.

midpoint:

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$x = \frac{x_1 + x_2}{2} \quad y = \frac{y_1 + y_2}{2}$$

$$4 = \frac{a + 3}{2} \quad 1 = \frac{b - 6}{2}$$

$$8 = a + 3 \quad 2 = b - 6$$

$$a = 5 \quad b = 8$$

∴ pairs (5, 8) (a, b)

$$a = \frac{4+3}{2}$$

$$4 = \frac{a+3}{2}$$

$$8 = a+3$$

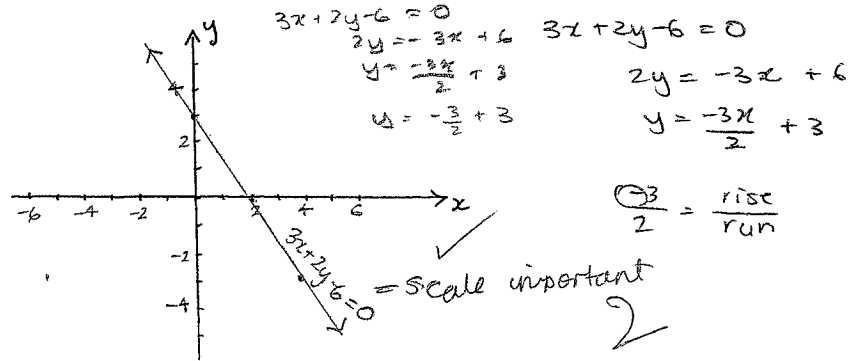
$$a = 5$$

$$b = \frac{1+6}{2}$$

$$2 = \frac{b-6}{2}$$

$$b = 8$$

- c) Sketch the graph of $3x + 2y - 6 = 0$ on the axes.



- d) If $y = mx + b$ make x the subject.

$$y - b = mx$$

$$x = \frac{y - b}{m}$$

$$\frac{y - b}{m}$$

2

$$d = \sqrt{(-2-5)^2 + (4-(-3))^2}$$

$$= \sqrt{-7^2 + 7^2}$$

$$= 7\sqrt{2}$$

$$d = \sqrt{(5-(-2))^2 + (4-(-3))^2}$$

$$= \sqrt{7^2 + 7^2}$$

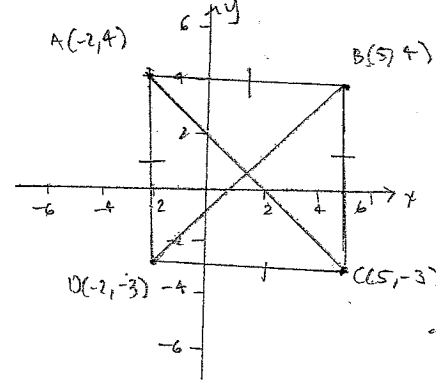
$$= 7\sqrt{2}$$

Question 21 (cont'd)

Ma

- e) Show that the diagonals of a square with vertices $A(-2, 4)$, $B(5, 4)$, $C(5, -3)$ and $D(-2, -3)$ are equal.

length of diagonals:



$$d_{AC} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(-2 - 5)^2 + (4 - (-3))^2}$$

$$= \sqrt{49 + 49} \quad \checkmark$$

$$= 7\sqrt{2}$$

$$d_{BD} = \sqrt{(5 - (-2))^2 + (4 - (-3))^2}$$

$$= \sqrt{49 + 49} \quad \checkmark$$

$$= 7\sqrt{2}$$

∴ The diagonals of the square ABCD are equal.

- f) How many weeks will it take for \$50 000 to earn \$1500 in interest if the flat rate is 4% p.a.

$$I = PRN$$

$$1500 = 50000 \times \frac{1}{100} \times N$$

$$P = 50000$$

$$R = 4\% \text{ p.a.}$$

$$= \frac{1}{13} \% \text{ per week}$$

$$I = PRN$$

$$1500 = 50000 \times \frac{1}{100} \times N$$

$$1500 = 50000 \times \frac{1}{100} \times N$$

$$1500 = 50000 \times \frac{1}{100} \times N$$

$$1500 = \frac{500N}{13}$$

$$19500 = 500N$$

$$\therefore N = 39$$

∴ it will take 39 weeks. Can you read it?

39.

16

Question 22 (12 marks)

Ma

- a) The table below shows the amount \$1 will grow to for various interest rates and time periods.

Accumulated value of \$1 (to four decimal places)									
Number of time periods	Interest rate								
	0.5%	1%	5%	6%	8%	10%	12%	15%	
1	1.0050	1.0100	1.0500	1.0600	1.0700	1.0800	1.1000	1.1200	1.1500
2	1.0100	1.0201	1.1025	1.1236	1.1449	1.1664	1.2100	1.2544	1.3225
3	1.0151	1.0303	1.1576	1.1910	1.2250	1.2597	1.3310	1.4049	1.5209
4	1.0202	1.0406	1.2155	1.2525	1.3108	1.3605	1.4641	1.5735	1.7490
5	1.0253	1.0510	1.2763	1.3382	1.4026	1.4693	1.6105	1.7623	2.0114
6	1.0304	1.0615	1.3401	1.4185	1.5007	1.5869	1.7716	1.9738	2.3131
7	1.0355	1.0721	1.4071	1.5036	1.6058	1.7138	1.9487	2.2107	2.6600
8	1.0407	1.0829	1.4775	1.5928	1.7182	1.8509	2.1436	2.4760	3.0590
9	1.0459	1.0937	1.5513	1.6895	1.8385	1.9990	2.3579	2.7731	3.5179
10	1.0511	1.1046	1.6289	1.7908	1.9672	2.1593	2.5937	3.1058	4.0456
11	1.0564	1.1157	1.7103	1.8983	2.1049	2.3316	2.8531	3.4785	4.6524
12	1.0617	1.1268	1.7959	2.0122	2.2522	2.5182	3.1384	3.8960	5.3503
18	1.0939	1.1961	2.4066	2.8543	3.3799	3.9960	5.5599	7.6900	12.3755
24	1.1272	1.2697	3.2251	4.0489	5.0724	6.3412	9.8497	15.1786	28.6252

Use the table to find:

(i) the accumulated value when \$7500 is invested at 6% p.a. compounded annually for 8 years.

$$A = P(1+R)^n$$

$$A_{7500} = P(1+R)^n \rightarrow \text{then if setting out}$$

$$= 7500(1+0.06)^8$$

$$= 7500 \times 1.5938$$

$$= 11953.50$$

The accumulated value is \$11953.50

- (ii) the compound interest earned.

$$I = A - P$$

$$= 11953.5 - 7500$$

$$= \$4453.50$$

∴ Compound interest Earned = \$4453.50

Question 22 (cont'd)

M

- b) \$12 500 is invested at a compound interest rate of 9% p.a. Interest, however is compounded monthly. Use the formula to calculate the amount to which the investment will grow in 4 years.

$$A = P(1+R)^n$$

$$P = 12500$$

$$R = 9\% \text{ p.a.}$$

$$= \frac{9}{12}\% \text{ per month}$$

$$n = 4 \times 12 = 48$$

$$A = 12500 \left(1 + \frac{9}{12}\%\right)^{48}$$

$$= 12500 \left(1 + \frac{3}{400}\right)^{48}$$

$$= 12500 \times 1.431 \dots$$

$$= \$17892.566 \dots$$

∴ The investment will grow to be Amount = \$17892.57 (cont'd)

- c) If the population of Bilby Downs is decreasing by 20% of its population every year. What would be the population in 2 years if it is now 800?

$$A = P(1+R)^n$$

$$P = 800$$

$$R = 20\%$$

$$n = 2$$

$$A = 800(1-0.2)^2$$

$$= 800 \times 0.64$$

$$= 512$$

∴ In 2 years the population of Bilby Downs will be 512.

- d) A DVD read/write player is purchased under the following terms.

Deposit: \$110
Repayments: \$41.85 each month for 2 years

- (i) Find the total amount paid for the DVD player.
- $$\text{Total Amount} = 110 + (41.85 \times 12 \times 2)$$
- $$= 110 + 1004.4$$
- $$= \$1114.40$$

∴ The total amount paid was \$1114.40

- (ii) If the marked price had been \$800 what percentage are the additional charges of the marked price.

$$\text{Additional Charges} = 1114.4 - 800$$

$$= \$314.40$$

$$\text{Percentage} = \frac{314.40}{800} \times 100$$

$$= 39.3\%$$

∴ The additional charges are 39.3% of the marked price

Question 23 (12 marks)

Mark

a) Use the quadratic formula to solve $3m^2 = 7 - m$

$$3m^2 + m - 7 = 0$$

$a = 3 \quad b = 1 \quad c = -7$

$$m = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

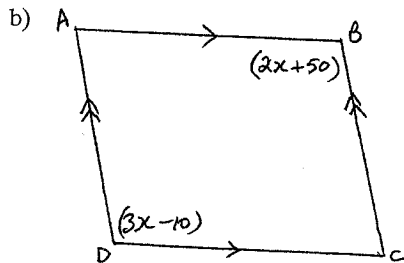
$$= \frac{-1 \pm \sqrt{(1)^2 - (4 \times 3 \times -7)}}{2 \times 3}$$

$$= \frac{-1 \pm \sqrt{1 + 84}}{6}$$

$$= \frac{-1 \pm \sqrt{85}}{6}$$

$3m^2 + m - 7 = 0$
 $a = 3 \quad b = 1 \quad c = -7$
 $m = \frac{-1 \pm \sqrt{(1)^2 - (4 \times 3 \times -7)}}{2 \times 3}$
 $= \frac{-1 \pm \sqrt{1 + 84}}{6}$
 $= \frac{-1 \pm \sqrt{85}}{6}$

$\therefore m = \frac{-1 + \sqrt{85}}{6}, \frac{-1 - \sqrt{85}}{6}$



Find the value of x in (give reasons).

$3x - 10 = 2x + 50$
 $x = 60$

$3x - 10 = 2x + 50$
 $x = 60$

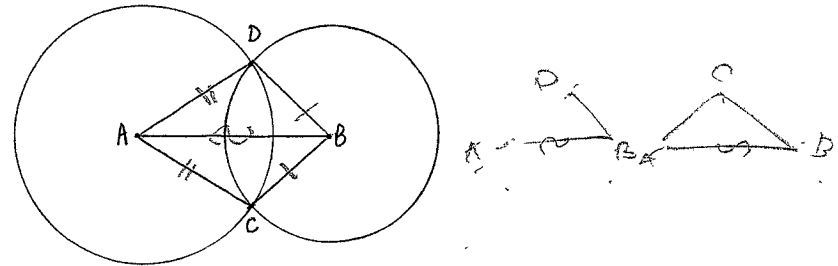
ABCD is a parallelogram as both pairs of opp sides are parallel
 \therefore as ABCD is a parallelogram both pairs of opp sides are equal
 $\therefore 3x - 10 = 2x + 50$
 $x = 60$

2

Question 23 (cont'd)

Mark

c)



A and B are the centres of two circles which intersect at C and D.

(i) Prove $\triangle ADB \cong \triangle ACB$

- $\triangle ADB \cong \triangle ACB$
1. AB is common
2. DB = CB (equal radii)
3. DA = CA (equal radii)
 $\therefore \triangle ADB \cong \triangle ACB$ (SSS)

3

(ii) and hence prove AB bisects \widehat{DAC}

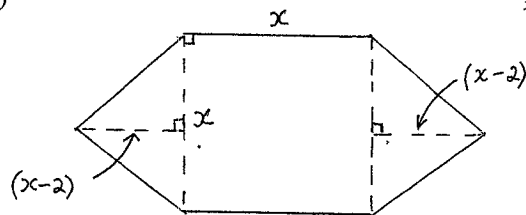
$\widehat{DAB} = \widehat{CAB}$ (corresponding angles are equal in congruent triangles)
 $\therefore \widehat{DAB} = \widehat{CAB} = x$
 $\therefore \widehat{DAB} = \widehat{CAB}$
 $\therefore \widehat{DAB} + \widehat{CAB} = \widehat{DAC}$
 $\therefore 2x = \widehat{DAC}$
 $\therefore x = \frac{\widehat{DAC}}{2}$
 $\therefore AB$ bisects \widehat{DAC}

$\widehat{DAC} = \widehat{DAB} + \widehat{CAB}$ (on diagram)
 $\widehat{DAB} = \widehat{CAB}$ (corresponding angles are equal in congruent triangles)
 $\therefore AB$ bisects \widehat{DAC}

(12)

Question 23 (cont'd)

d)



$$x^2 + x(x-2)$$

$$= x^2 + x^2 - 2x$$

Mark

$$0 = 2x^2 - 2x - 60$$

$$0 = x^2 - x - 30$$

$$a=1 \quad b=-1 \quad c=-30$$

$$x = \frac{-(-1) \pm \sqrt{(-1)^2 - (4 \times 1 \times -30)}}{2 \times 1}$$

$$= \frac{1 \pm \sqrt{1+121}}{2} = \frac{1 \pm 11}{2} = 6, -$$

If all dimension of this figure are in metres and the area of the shape is 60m^2 .

(i) Write an algebraic expression in x for the area.

1

$$A = \text{square} + 2 \text{ triangles} + \text{triangle}$$

$$= s^2 + \frac{1}{2}bh + \frac{1}{2}bh$$

$$= x^2 + \frac{x(x-2)}{2} + \frac{x(x-2)}{2}$$

$$= x^2 + x(x-2)$$

$$= x^2 + x^2 - 2x$$

$$\therefore \text{Area} = 2x^2 - 2x$$

(ii) Calculate the value of x .

2

$$60 = 2x^2 - 2x$$

$$0 = 2x^2 - 2x - 60$$

$$0 = x^2 - x - 30$$

$$0 = (x-6)(x+5)$$

$$x = 6, -5$$

check

1. $x \neq -5$ as x represents a length which can not be a negative number.

2. $\therefore x = 6$

$$\therefore x = 6 \text{ m}$$