



THE KING'S SCHOOL

Mathematics Level 5.2 Year 9 End of Year Examination November 2012

- Working time – 90 minutes
- Attempt **all** questions, answering in the writing booklets provided.
- Board approved calculators may be used.
- Show all necessary working.
- Start a new writing booklet for each Question or answer on answer sheet provided.
- Write your Name, Question and Class in each new writing booklet.

Marker's Use Only						
Question	Algebra	Data	Geometry	Measurement	Number	Total
1					/27	/27
2	/27					/27
3				/15		/15
4			/14			/14
5		/17				/17
Totals	/27	/17	/14	/15	/27	/100

Start A New Answer Booklet
Question 1 (Number) (27 marks)

Marks

-
- (a) Round 0.003265 correct to three significant figures. 1
- (b) Simplify the ratio 14 : 21. 1
- (c) Stantonovic works as a physio and is paid \$85 per hour. Her normal week is 38 hours. She is paid overtime at the rate of time-and-a-half for any hours worked after 38 hours.
- How much will she earn in a week she works 42 hours? 2
- (d) Find $27\frac{1}{2}\%$ of 3.5 km. 1
- (e) Write as a basic numeral 5.72×10^{-4} 1
- (f) “*Baldman Hair Gel*” is sold in two different sizes. If Mr Gerber is to make a purchase from the options below, which is the best buy for him? Justify your answer mathematically.
- A:** 400 mL for \$8.40 or
B: 600 mL for \$11.80 2
- (g) To make standard concrete, you mix gravel, sand and cement in the ratio 5 : 3 : 1. I wish to make 180 kg of concrete.
- How much gravel will I need? 2
- (h) A letter is chosen at random from the word WOOLLOMOLOO. What is the probability of choosing the letter
- (i) W? 1
- (ii) O? 1
- (iii) Y? 1

Question 1 will continue on the next page

Question 1 (Number) (continued)**Marks**

-
- (i) The probability that the Wallabies will win the next World Cup is $\frac{4}{7}$. What is the probability that the Wallabies will not win the next World Cup? **1**
- (j) Weather records show that it has rained on Christmas Day 16 times in the last 100 years.
- (i) Describe using one word, the chance of it raining on Christmas Day this year. **1**
- (ii) What is the probability of it going to rain this year on Christmas Day? **1**
- (k) Into a barrel 175 tickets are placed.
- 100 blue tickets, which are numbered 1-100
 - 50 red tickets, which are numbered 1-50
 - 25 green tickets, which are numbered 1-25
- If one ticket is drawn at random from the barrel, what is the probability that the ticket is
- (i) green? **1**
- (ii) the number 36? **1**
- (iii) a number less than 25? **1**
- (iv) either a number 36 or 24? **1**
- (v) not a red ticket? **1**

Question 1 will continue on the next page

- (l) The table below allows taxpayers to work out their income tax payable for the financial year.

Tax Rates 2012-13

The following rates for 2012-13 apply from 1 July 2012.

Taxable income	Tax on this income
0 - \$18,200	Nil
\$18,201 - \$37,000	19c for each \$1 over \$18,200
\$37,001 - \$80,000	\$3,572 plus 32.5c for each \$1 over \$37,000
\$80,001 - \$180,000	\$17,547 plus 37c for each \$1 over \$80,000
\$180,001 and over	\$54,547 plus 45c for each \$1 over \$180,000

The above rates do not include the Medicare levy of 1.5%.

Julianne’s gross income is \$86 523. Her total tax deductions are \$2 810.

- (i) Find her taxable income. 1
- (ii) Calculate the amount of income tax that she has to pay. 2
- (iii) If her Medicare Levy is 1.5% of her taxable income, how much does she pay? 1
- (iv) How much will her refund/tax payable be if she has had \$23 478 taken out of her pay packet throughout the financial year as tax instalments? 2

End of Question 1

Start A New Answer Booklet
Question 2 (Algebra) (27 marks)

Marks

-
- (a) Write in index form $a \times a \times b \times b \times a$ **1**
- (b) If $\frac{x}{3} = 6$, find the value of x **1**
- (c) Simplify $3y + 8 - 7y$ **1**
- (d) Simplify $\frac{2t^2}{4t}$ **1**
- (e) Simplify the following fully:
- (i) $y^8 \times y^4$ **1**
- (ii) $24x^6 \div 6x^2$ **2**
- (iii) $(x^3)^2$ **1**
- (iv) $\frac{x}{4} \times \frac{3}{y}$ **1**
- (v) $\frac{a}{3} + \frac{a}{4}$ **2**
- (f) $16 + 2(x - 3)$ **2**
- (g) Factorise fully $12a - 18ab$ **2**
- (h) Solve $3x - 5 = 16$ **2**
- (i) Given $V = u + at$, find the value of V if $a = 9.8$, $u = 15$ and $t = 4$ **1**

Question 2 will continue on the next page

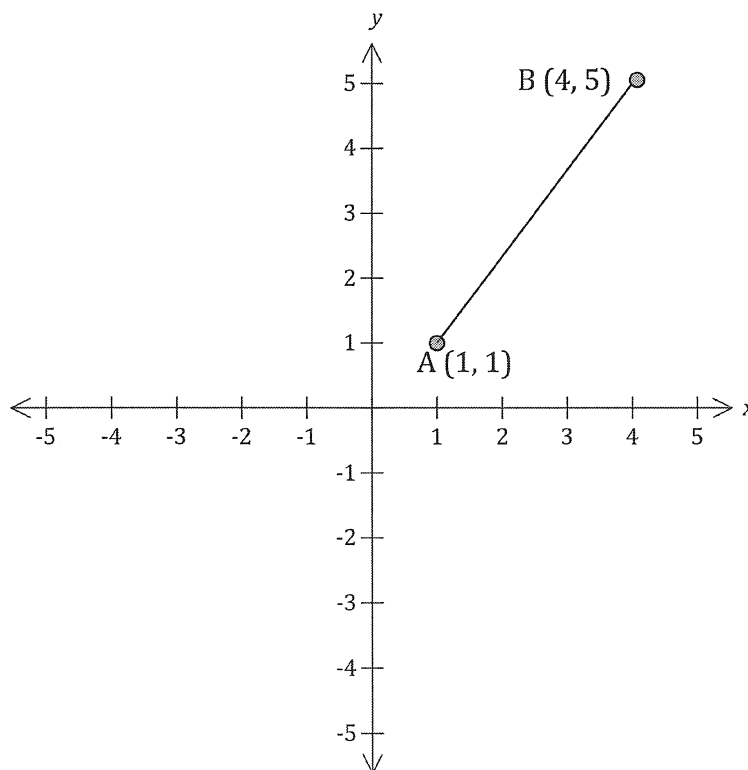
(j) ANSWER THIS QUESTION ON THE ANSWER SHEET PROVIDED

- (i) Copy and complete the table of values for $y = 2 - 3x$ 1

x	-1	0	1
y			

- (ii) Hence, graph $y = 2 - 3x$ 2
- (iii) On the same number plane, graph $y = -4$ 1
- (iv) Hence, find the intersection of the lines $y = 2 - 3x$ and $y = -4$ 1

(k) RETURN TO YOUR ANSWER BOOKLET TO ANSWER THIS QUESTION

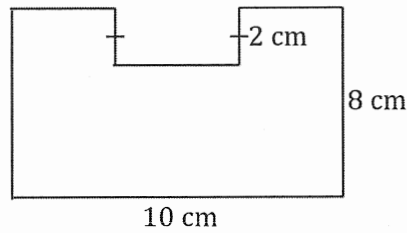


- (i) Calculate the distance from A(1, 1) to B(4, 5). 1
- (ii) Find the gradient of AB. 1
- (iii) Find the midpoint of AB. 2

End of Question 2

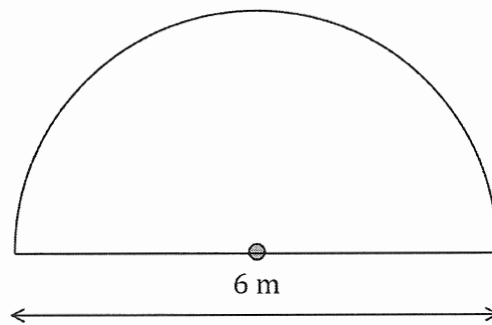
(a) Calculate the perimeter of the following shapes, correct to one decimal place where needed:

(i)



2

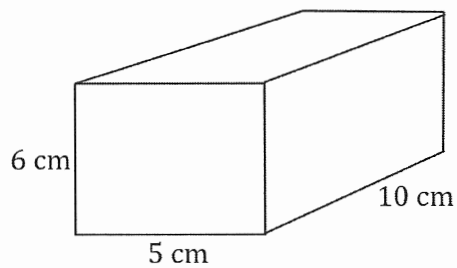
(ii)



3

(b) Calculate the surface area of the following rectangular prism.

2



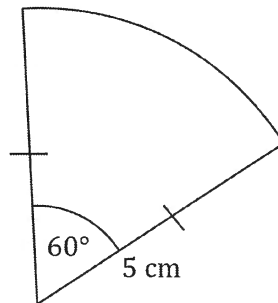
Question 3 will continue on the next page

Question 3 (Measurement) (continued)

Marks

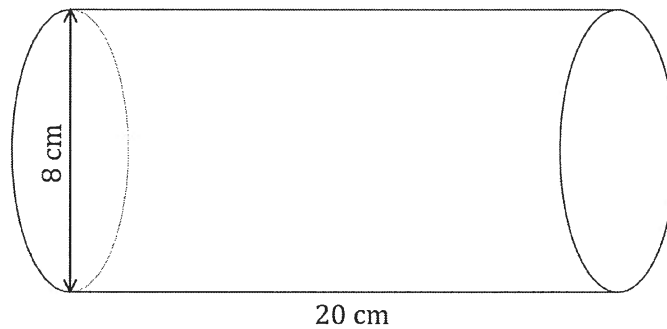
(c) Calculate the area of the following sector, correct to one decimal place.

2

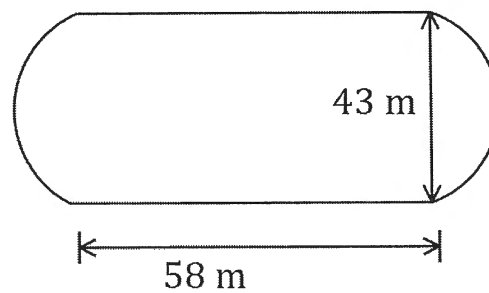


(d) Calculate the surface area of the following closed cylinder correct to two decimal places.

2



(e) A sports ground is to be covered in turf.



(i) Calculate the area of the ground to the nearest square metre.

3

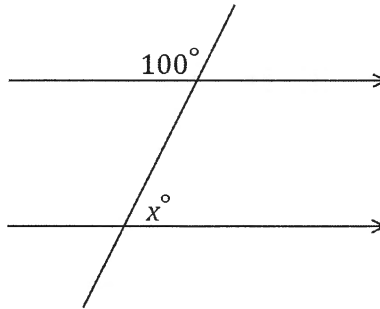
(ii) If turf costs \$11.50 per square metre, what will the cost be to turf the ground?

1

End of Question 3

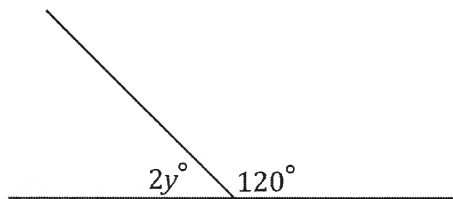
(a) Find the value of x .

1



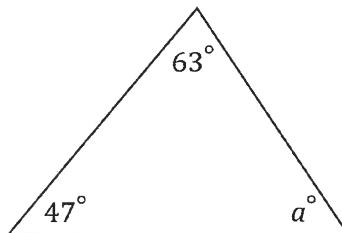
(b) Find the value of y .

2



(c) Find the value of a .

1



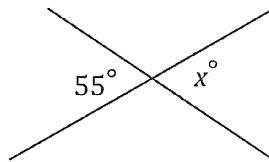
Question 4 will continue on the next page

Question 4 (Geometry) (continued)

Marks

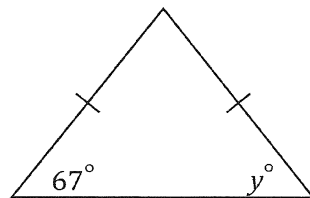
(d) For the following, find the value of the pronumeral, giving a geometrical reason.

(i)



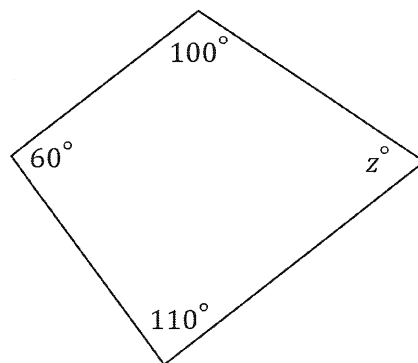
2

(ii)



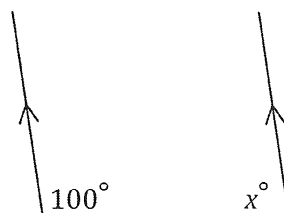
2

(iii)



2

(iv)



2

(e) What is the angle sum of a pentagon?

1

(f) Name the quadrilateral which has equal diagonals that meet at right angles.

1

End of Question 4

Answer this Question on the SEPARATE Answer Sheet provided
Question 5 (Data) (17 marks)

Marks

(a) For the following set of scores: 15, 46, 36, 21, 40, 28, 23, 32, 18, 36, find the

- (i) range 1
- (ii) mean 1
- (iii) mode 1
- (iv) median 1

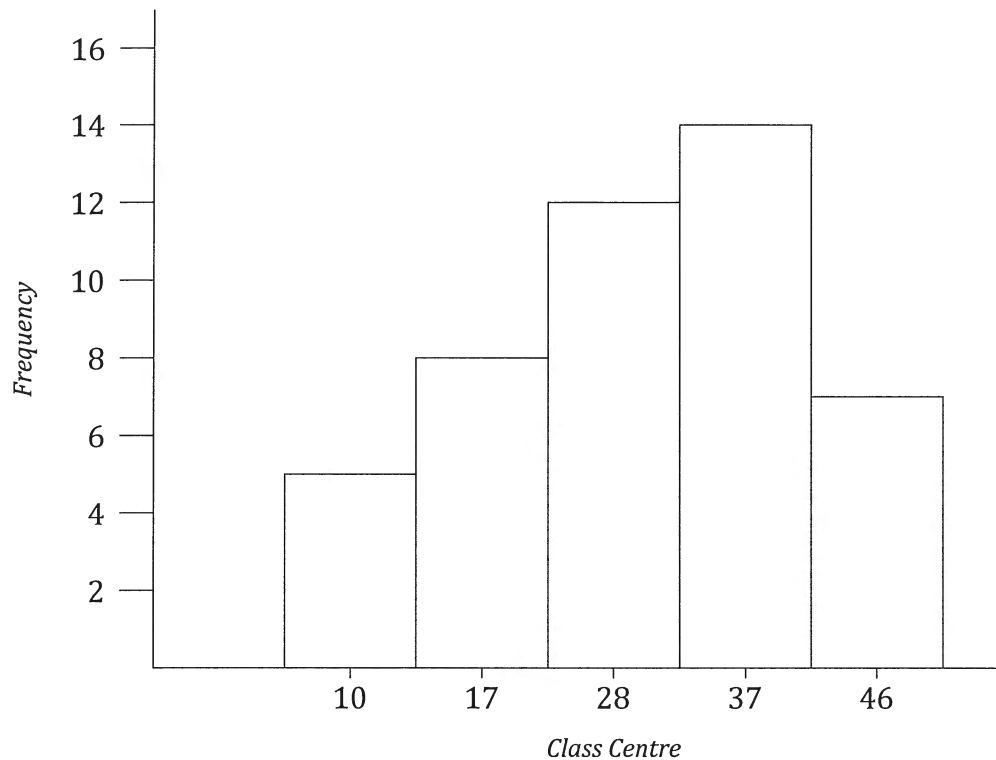
(b) The following is the number of correct calculations in a quiz:

Score (x)	Frequency (f)	fx	Cumulative Frequency cf
3	2		
4	3		
5	7		
6	4		
7	6		
8	3		
	$\Sigma f =$	$\Sigma fx =$	

- (i) Complete the frequency distribution table. 3
- (ii) Calculate the mean. 1
- (iii) What is the mode. 1
- (iv) Find the median. 1
- (v) What percentage of students scored better than 6? 2

Question 5 continues on the next page

(c) The graph below is a grouped frequency histogram.



- (i) On the answer sheet provided, draw a frequency polygon. 2
- (ii) Complete the grouped frequency table. 2
- (iii) What is the modal class? 1

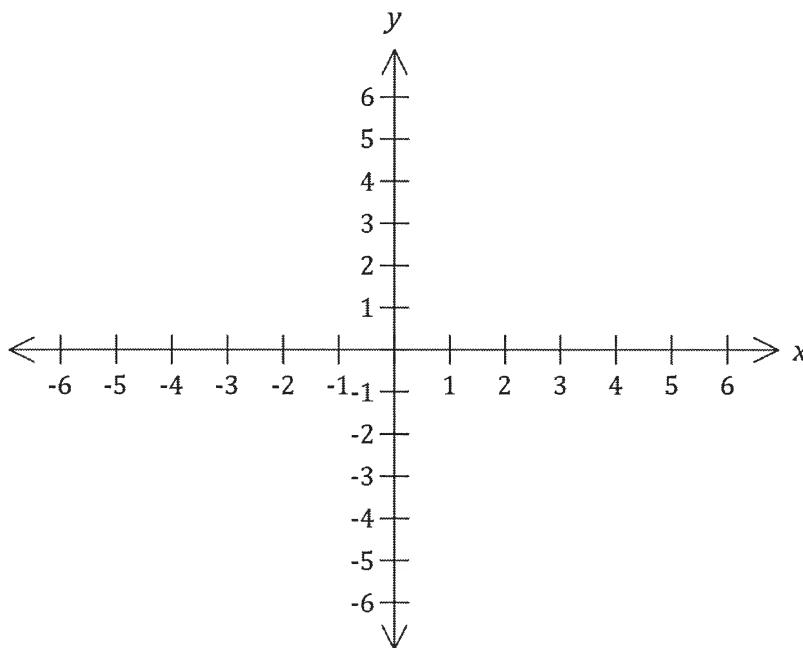
End of Examination

Question 2 (Algebra) (5 marks) Answer Sheet

(j) (i) Complete the table of values for $y = 2 - 3x$ **1**

x	-1	0	1
y			

(ii) Hence, on the number plane below graph $y = 2 - 3x$ **2**



(iii) On the number plane above, also graph $y = -4$ **1**

(iv) Hence, find the intersection of the lines $y = 2 - 3x$ and $y = -4$ **1**

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Question 5 (Data) (17 marks) Answer Sheet

- (a) (i) range **1**
- (ii) mean **1**
- (iii) mode **1**
- (iv) median **1**

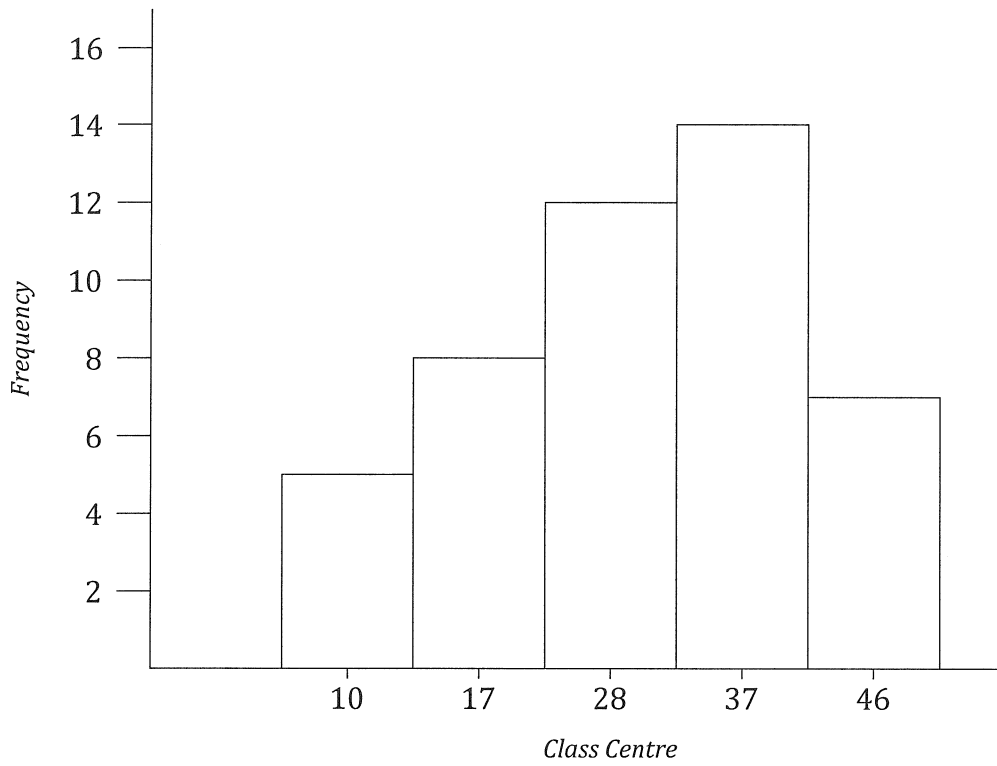
- (b) (i) **3**

Score (x)	Frequency (f)	fx	Cumulative Frequency cf
3	2		
4	3		
5	7		
6	4		
7	6		
8	3		
	$\Sigma f =$	$\Sigma fx =$	

- (ii) mean **1**
- (iii) mode **1**
- (iv) median **1**
- (v) percentage **2**

(c) (i)

2



(ii)

2

<i>Class</i>	<i>Class Centre</i>	<i>Frequency</i>
6-14		5
15-23		8
24-32		
33-41		14
42-50		

(iii) modal class

1

Y9 5.2 Yearly Examination 2012

a) 0.00327

b) $2:3$

c) $38 \times \$85 = \3230

$4 \times 1.5 \times 85 = \510

Total = $\$3740$

d) 0.9625 km

e) 0.000572

f) B: 600ml for $\$11.80$

as A is $\$12.60$ for 600ml.

g) 1 part = 20kg
 $\therefore 100 \text{ kg of Gravel}$

h) i) $P(W) = \frac{1}{11}$

ii) $P(O) = \frac{6}{11}$

iii) $P(Y) = 0$

i) $\frac{3}{7}$

ii) Not very likely

iii) $\frac{16}{100} = \frac{4}{25}$

k) i) $P(\text{Green}) = \frac{25}{175} = \frac{1}{7}$

ii) $P(36) = \frac{2}{175}$

iii) $P(<25) = \frac{72}{175}$

iv) $P(36 \text{ or } 24) = \frac{5}{175} = \frac{1}{35}$

v) $P(\text{Not Red}) = \frac{125}{175} = \frac{5}{7}$

i) $\$83713$

ii) $\$17547 + 0.37(83713 - 80000)$
 $= \$18920.81$

iii) $\$1255.70$

iv) Tax payable = $\$20176.51$

$\therefore \text{Refund} = \3301.49

Question 2

a) $a^3 b^2$

b) 18

c) $-4y + 8$

d) $\frac{t}{2}$

e) i) y^{12}

ii) $4x^4$

iii) x^6

iv) $\frac{3x}{4y}$

v) $\frac{7a}{12}$

f) $16 + 2x - 6$
 $= 10 + 2x$

a) $6a(2 - 3b)$

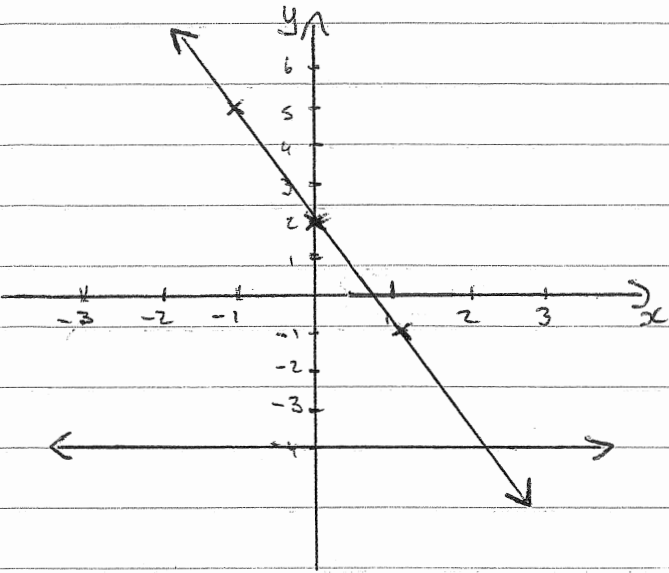
b) $3x = 21$
 $x = 7$

i) 54.2

i)

x	-1	0	1
y	5	2	-1

ii)



iii)



iv) (2, -4)

v) i) 3

ii) gradient = $\frac{4}{3}$

iii) $(2\frac{1}{2}, 3)$

Question 3

i) i) $P = 10 + 10 + 8 + 8 + 2 + 2 = 40\text{cm.}$

ii) $P = \pi \cdot 3 + 6 = 15.42\text{m.}$

b) $SA = 2 \times 6 \times 5 + 2 \times 6 \times 10 + 2 \times 5 \times 10 = 280\text{cm}^2$

c) $A = \frac{60}{360} \times \pi \times 8^2 = 13.0\text{cm}^2$

d) $SA = 2 \times \pi \times 4^2 + 2 \times \pi \times 4 \times 20 = 603.19\text{cm}^2$

e) i) $A = 58 \times 43 + \pi \times 21.5^2 = 3946\text{m}^2$

ii) $3946 \times \$11.50 = \$45379.$

Question 4

a) 80°

b) $2y = 60^\circ$
 $y = 30^\circ$

c) $a = 70$

d) i) $x = 55$ (vert opp \angle 's)

ii) $y = 67$ (base \angle 's of isos Δ)

iii) $z = 90^\circ$ (\angle sum of quad)

iv) $x = 80^\circ$ (corr. \angle 's in \parallel lines)

e) 540°

f) Square.

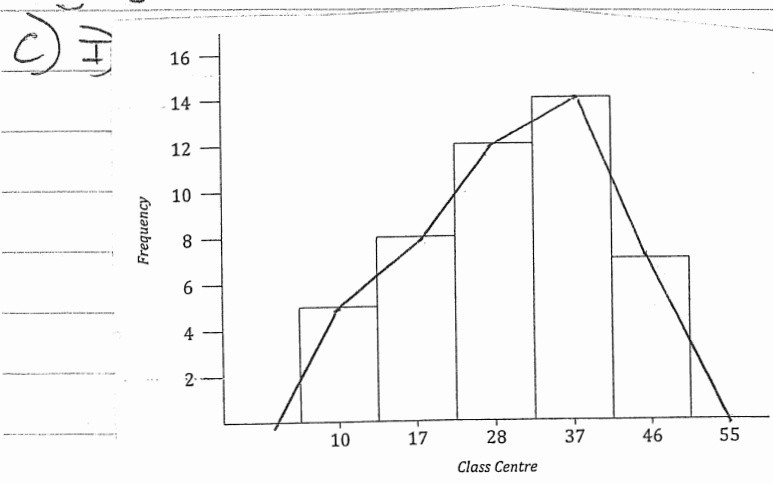
Question 5

- a) I) Range = 31
- II) mean = 29.5
- III) mode = 36
- IV) median = 30

b) I)

Score (x)	Frequency (f)	fx	Cumulative Frequency of
3	2	6	2
4	3	12	5
5	7	35	12
6	4	24	16
7	6	42	22
8	3	24	25
$\Sigma f = 25$		$\Sigma fx = 143$	

- II) 5.72
- III) 5
- IV) 6
- V) 36%



c) II)

Class	Class Centre	Freq.
6-14	10	5
15-23	17	8
24-32	28	12
33-41	37	14
42-50	46	7

III) 33-41.