Carlingford High School

Mathematics

Year 10 (5.1) Term 1 Exam

2018

Name: _____

Time allowed: 50 minutes

- Answer all questions in the spaces provided
- All questions are worth 1 mark unless otherwise stated
- Complete the examination in blue or black pen
- Draw diagrams using pencil and a ruler

Marking Scale

Topic	Outcome	Question(s)	Mark
Linear Relationships	Graphing Tables of Values	1-4	/13
	Length, Midpoint and Gradient	5-7	/11
	Literacy	8	/10
	Graphing Lines	9-13	/8
		Total	**/42**
Area and Surface Area	Perimeter	1	/8
	Area	2,3	/10
	Surface Area	4	/7
	Parts of a Circle	5	/5
		Total	**/30**
		Exam Mark	**/72**
			%

Linear Relationships

Question 1

Complete each table of values using the given equation.

a $y = x - 2$

x	0	1	2	3
y				

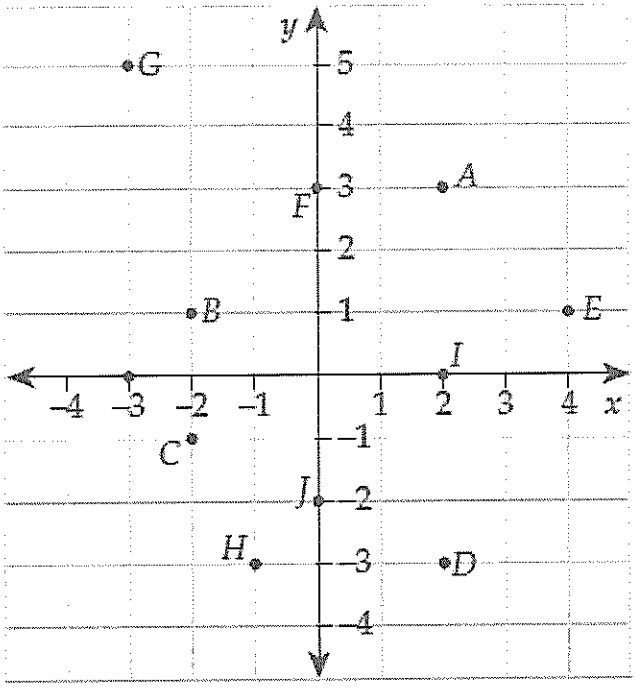
b $y = 3x + 1$

x	-1	1	2
y			

c $q = 4p - 2$

p	-2	0	3
q			

Question 2



Use the number plane to complete the coordinates.

(a) A(2,_____)

(b) B(_____, 1)

(c) C(_____,_____)

(d) D(_____, _____)

(e) F(_____,_____)

(f) I(_____,_____)

Question 3

(a) In which quadrant does the point G lie?

_____

(b) What is the point (0, 0) commonly called?

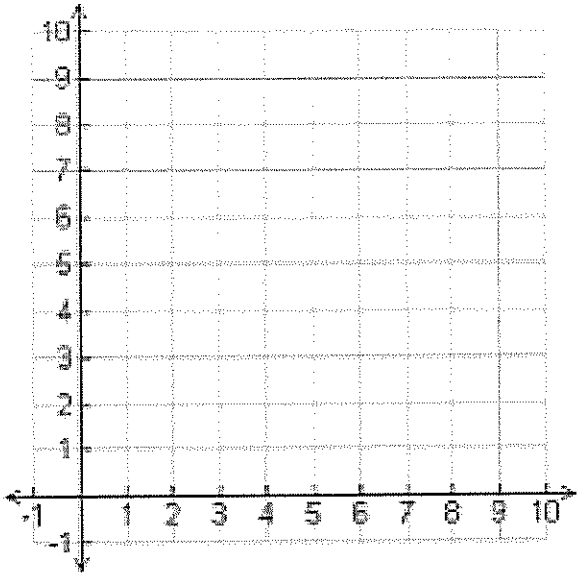
_____ ri _____ _____ n

Question 4

Graph this table of values.

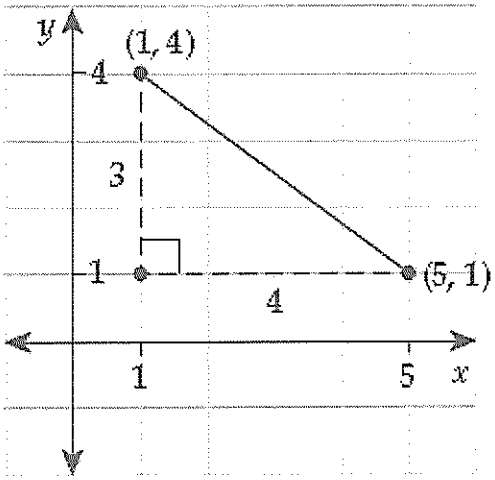
x	0	3	6	9
y	1	3	5	7

*You don't need to join the points



[2 marks]

Question 5



Use the above graph to find the:

(a) Length of the interval.

$c^2 = a^2 + b^2$

$c^2 =$ _____$^2 +$ _____^{2}

$c =$ _____ [2 marks]

(b) Midpoint of the interval.

$M =$ (_____ , _____)

(c) Gradient of the line.

$m = \frac{Rise}{Run}$

$= -$ _____

Question 6

Given the points (-2, 1) and (3, 3)

(a) $x_1 =$ _____

(b) $y_2 =$ _____

(c)

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

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

$d =$ _____ (1 decimal place) [2 marks]

Question 7

(a) What is the average of -2 and 3?

_____

(b) What is the average of 1 and 3?

_____

(c) Find the midpoint of the line joining (-2, 1) and (3, 3).

$M =$ (_____ , _____)

Question 8

average, axis , coordinates, gradient, interval, negative, number, Pythagoras, quadrants, substitute

Use one of the above words to complete each sentence.
(Marks will be deducted for incorrect spelling)

(a) To complete a table of values,

_____ each *x*-value into the equation to find the *y*-value.

(b) A _____ plane is a grid for plotting points and drawing graphs.

(c) The *x*-_____ is horizontal and has the equation $y = 0$.

(d) The number plane is divided into 4 _____.

(e) (3, 1) are the _____ of a point on the number plane.

(f) A section of a line with definite length is called an _____.

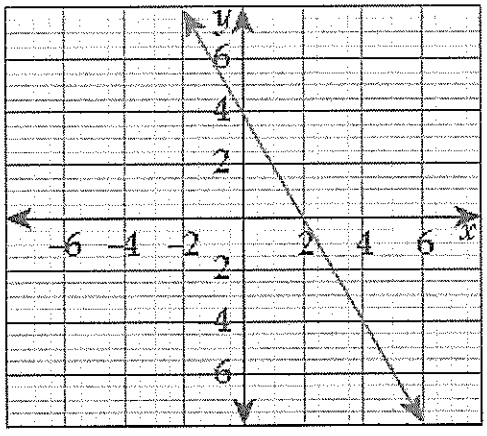
(g) _____ theorem is used to find the distance between two points.

(h) To find a midpoint, find the _____ of the *x*-values and *y*-values.

(i) The _____ is a value that measures the slope or steepness of a line.

(j) A line decreasing from left to right has a _____ gradient.

Question 9



(a) *x*-intercept = _____

(b) *y*-intercept = _____

Question 10

Two of the following points lie on the line with equation $y = 2x + 3$. Write *yes* or *no* next to each point.

(a) (0, 3) _____

(b) (-2, 1) _____

(c) (10, 23) _____ [2 marks]

Question 11

$$\begin{aligned} y &= 4 - 3x \\ &= 4 - 3 \times 1 \\ &= 1 \end{aligned}$$

The above working shows that the point (_____, 1) lies on the line $y = 4 - 3x$.

Question 12

Write true or false next to each statement.

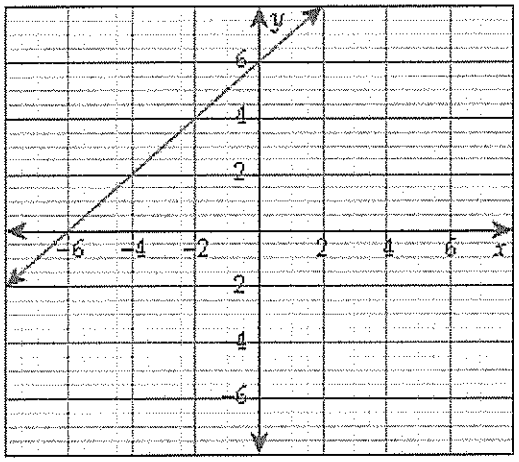
(a) $x = 0$ is the equation of the *x*-axis. _____

(b) $y = 2$ is a vertical line. _____

(c) $x = -5$ is a vertical line. _____

[2 marks]

Question 13



This line has gradient 1 and y-intercept 6. Use the formula $y = mx + b$ to write the equation of the line.

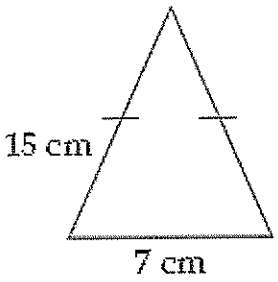
_____

Area and Surface Area

Question 1

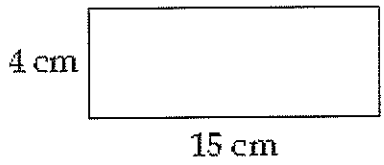
Find the perimeter of each shape.

(a)



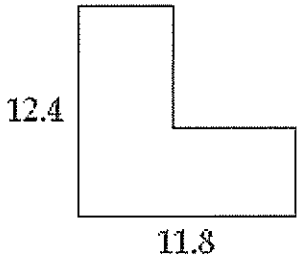
Perimeter = _____ cm

(b)



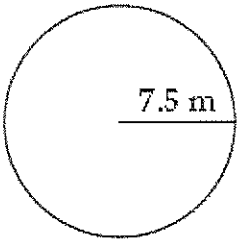
Perimeter = _____ cm

(c)



Perimeter = _____

(d)

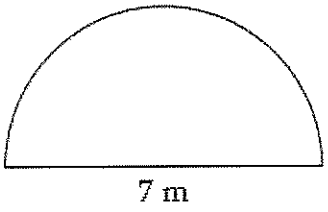


Perimeter $= 2\pi r$

$= 2\pi \times$ _____

= _____ m (1 decimal place)

(e)

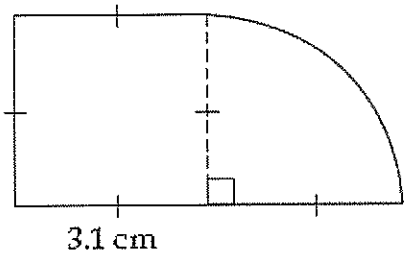


Perimeter $= \pi \times 7 +$ _____

= _____ m (nearest metre)

[2 marks]

(f)



Perimeter $= \frac{1}{4} \times 2 \times$ _____ $\times 3.1 + 4 \times 3.1$

= _____ cm (1 decimal place)

[2 marks]

Question 2

Given that $1cm^2 = 100mm^2$

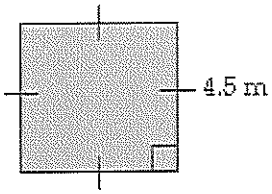
(a) $5cm^2 =$ _____ mm^2

(b) _____ $cm^2 = 250mm^2$

Question 3

Find the area of each shape.

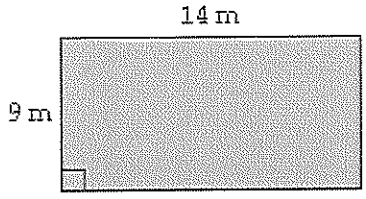
(a)



Area $= s^2$

$=$ _____ m^2

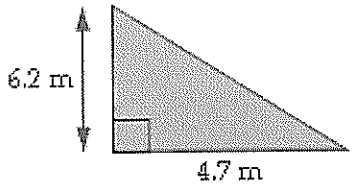
(b)



Area $= lw$

$=$ _____

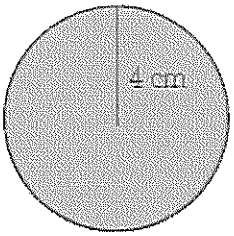
(c)



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

$=$ _____ m^2

(d)

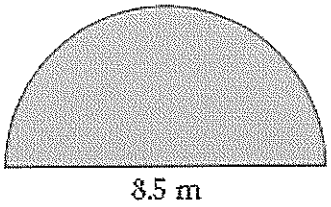


Area $= \pi r^2$

$=$ _____ cm^2

(1 decimal place)

(e)

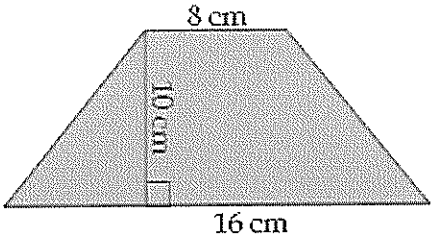


Area $= \frac{1}{2} \times \pi \times$ _____ ^{2}

$=$ _____ m^2 (1 decimal place)

[2 marks]

(f)



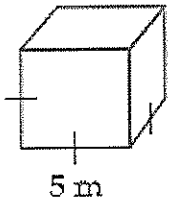
Area $= \frac{1}{2} \times$ _____ $\times$ (_____ $+$ _____)

$=$ _____ cm^2 [2 marks]

Question 4

Find the surface area of each prism.

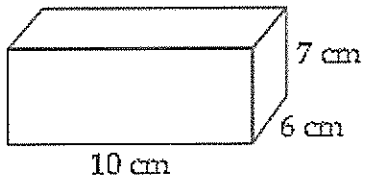
(a)



Surface Area $= 6s^2$

$=$ _____ cm^2

(b)

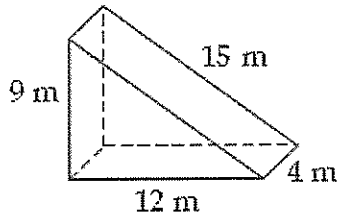


Surface Area

$= 2 \times [(10 \times 6) + (10 \times 7) + (\_\_\_\_ \times \_\_\_\_)$

$= \_\_\_\_\_ cm^2$ [2 marks]

(c)

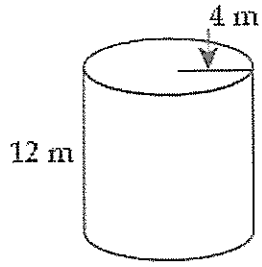


Surface Area

$= (2 \times \frac{1}{2} \times 12 \times \_\_\_\_\_) + (12 \times 4) + (9 \times 4)$
$+ (15 \times 4)$

$= \_\_\_\_\_ m^2$ [2 marks]

(d)



Surface Area

$= (2\pi \times 4^2) + (\_\_\_\_\_ \times 4 \times 12)$

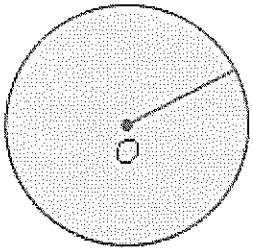
$= \_\_\_\_\_ m^2$ (1 decimal place)

[2 marks]

Question 5

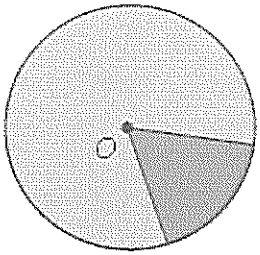
Write the name of each circle part.

(a)



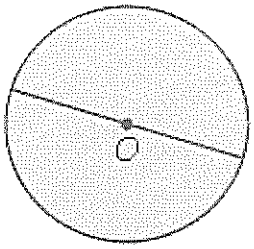
_____

(b)



_____

(c)

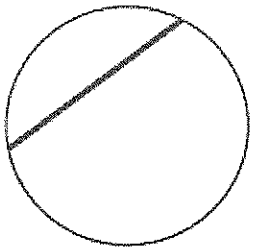


_____

(d)

_____

(e)



_____

END OF TEST

Linear Relationships

Question 1

Complete each table of values using the given equation.

a $y = x - 2$

x	0	1	2	3
y	-2	-1	0	1

✓

b $y = 3x + 1$

x	-1	1	2
y	-2	4	7

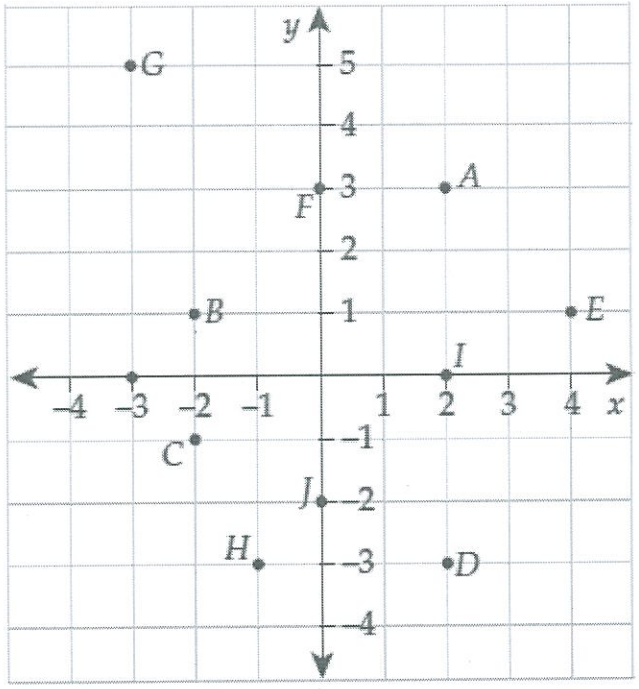
✓

c $q = 4p - 2$

p	-2	0	3
q	-10	-2	10

✓

Question 2



Use the number plane to complete the coordinates.

(a) A(2, 3) ✓

(b) B(-2 , 1) ✓

(c) C(-2 , -1) ✓

(d) D(2 , -3) ✓

(e) F(0 , 3) ✓

(f) I(2 , 0) ✓

Question 3

(a) In which quadrant does the point G lie?

2nd ✓

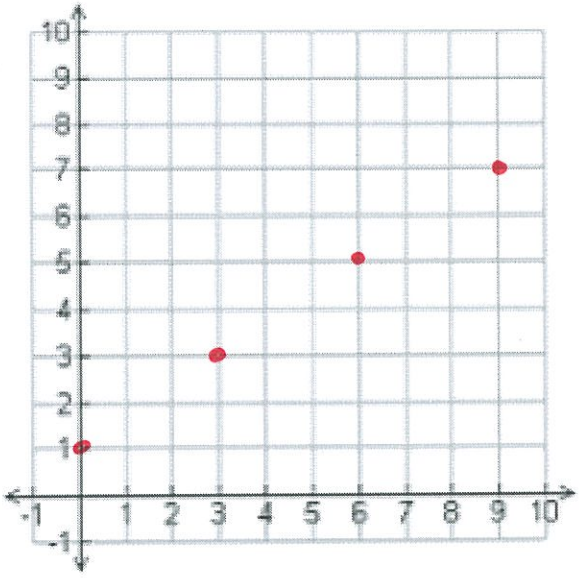
(b) What is the point (0, 0) commonly called?

O ri g i n ✓

Question 4

Graph this table of values.

x	0	3	6	9
y	1	3	5	7

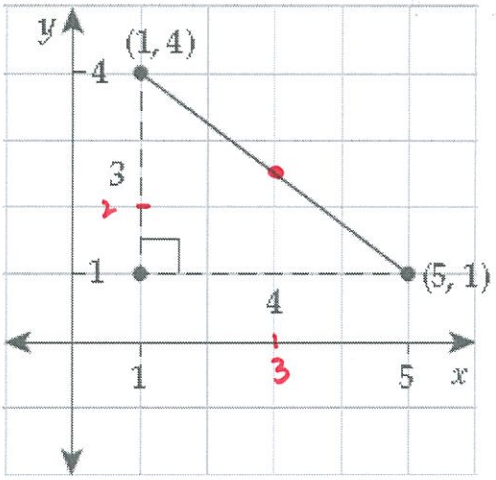


[2 marks]

Do not need to 'join dots.

// ✓

Question 5



Use the above graph to find the:

(a) Length of the interval.

$c^2 = a^2 + b^2$

$c^2 =$ 3 $^2 +$ 4 ^{2} ✓

$c =$ 25 ✓ [2 marks]

(b) Midpoint of the interval.

$M =$ (3 , 2.5) ✓

(c) Gradient of the line.

$m = \frac{Rise}{Run}$

$= -$ 3/4 ✓

Question 6

Given the points (-2, 1) and (3, 3)

(a) $x_1 =$ -2 ✓

(b) $y_2 =$ 3 ✓

(c)

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

$d = \sqrt{(3 - -2)^2 + (3 -$ 1 $)^2}$ ✓

$d =$ 5.3 (1 decimal place) ✓ [2 marks]

Question 7

(a) What is the average of -2 and 3?

1/2 or 0.5 ✓

(b) What is the average of 1 and 3?

2 ✓

(c) Find the midpoint of the line joining (-2, 1) and (3, 3).

CFE

$M =$ (1/2 , 2) ✓

Question 8

average, axis , coordinates, gradient, interval, negative, number, Pythagoras, quadrants, substitute

Use one of the above words to complete each sentence.
(Marks will be deducted for incorrect spelling)

(a) To complete a table of values,

Substitute each *x*-value into the equation to find the *y*-value. ✓

(b) A number plane is a grid for plotting points and drawing graphs. ✓

(c) The *x*-axis is horizontal and has the equation $y = 0$. ✓

(d) The number plane is divided into 4 quadrants. ✓

(e) (3, 1) are the coordinates ✓ of a point on the number plane.

(f) A section of a line with definite length is called an interval. ✓

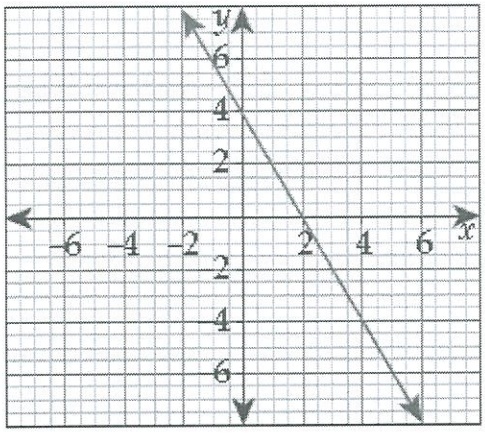
(g) Pythagoras theorem is used to find the distance between two points. ✓

(h) To find a midpoint, find the average of the *x*-values and *y*-values. ✓

(i) The gradient is a value that measures the slope or steepness of a line. ✓

(j) A line decreasing from left to right has a negative gradient. ✓

Question 9



(a) *x*-intercept = 2 ✓

(b) *y*-intercept = 4 ✓

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Question 10

Two of the following points lie on the line with equation $y = 2x + 3$. Write *yes* or *no* next to each point.

(a) (0, 3) Yes

(b) (-2, 1) No ✓✓

(c) (10, 23) Yes [2 marks]

Question 11

$$\begin{aligned} y &= 4 - 3x \\ &= 4 - 3 \times 1 \\ &= 1 \end{aligned}$$

The above working shows that the point

(1, 1) lies on the line $y = 4 - 3x$. ✓

Question 12

Write true or false next to each statement.

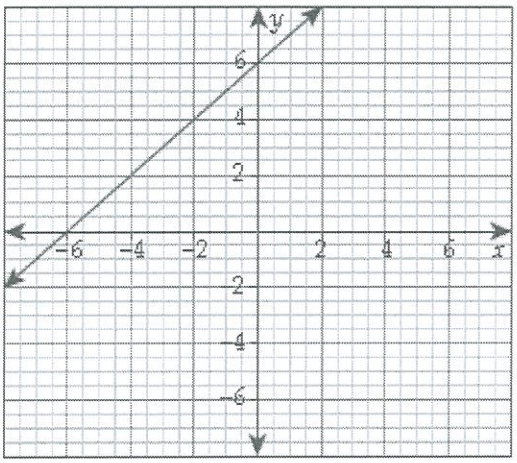
(a) $x = 0$ is the equation of the *x*-axis. False

(b) $y = 2$ is a vertical line. False

(c) $x = -5$ is a vertical line. True ✓✓

[2 marks]

Question 13



This line has gradient 1 and y-intercept 6. Use the formula $y = mx + b$ to write the equation of the line.

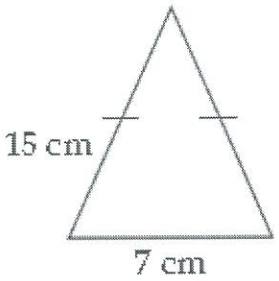
$y = x + 6$ ✓

Area and Surface Area

Question 1

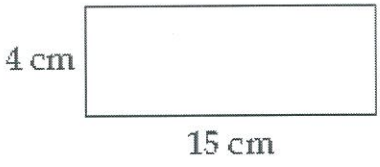
Find the perimeter of each shape.

(a)



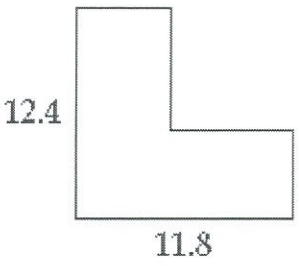
Perimeter = $2 \times (15) + 7 = 37$ ✓ cm

(b)



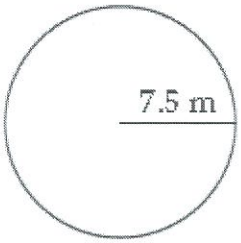
Perimeter = $(2 \times 4) + (2 \times 15) = 38$ ✓ cm

(c)



Perimeter = $(2 \times 11.8) + (2 \times 12.4)$ ✓
$= 48.4$

(d)

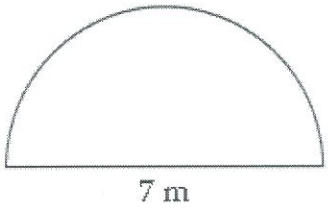


Perimeter = $2\pi r$

$= 2\pi \times 7.5$

$= 47.1$ ✓ m (1 decimal place.)

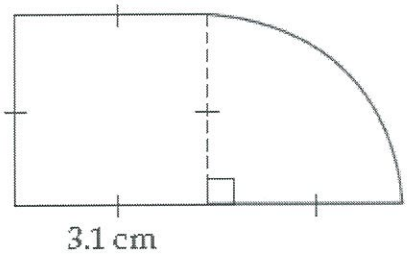
(e)



Perimeter = $\pi \times 7 +$ 7 ✓

$=$ 29 ✓ m [2 marks]
(nearest metre)

(f)



Perimeter = $\frac{1}{4} \times 2 \times$ π $\times 3.1 + 4 \times 3.1$ ✓

$=$ 17.3 ✓ cm [2 marks]
(1 dp)

Question 2

Given that $1cm^2 = 100mm^2$

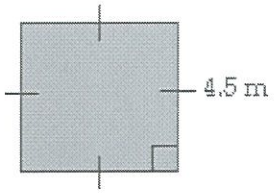
(a) $5cm^2 =$ 500 mm^2 ✓

(b) 2.5 $cm^2 = 250mm^2$ ✓

Question 3

Find the area of each shape.

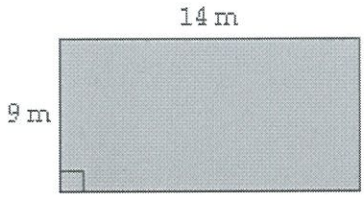
(a)



Area $= s^2$

$=$ $4.5^2 = 20.25$ m^2 ✓

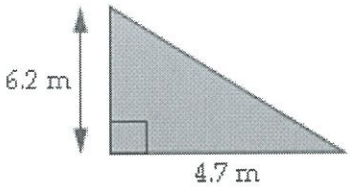
(b)



Area $= lw$

$=$ $9 \times 14 = 126\ m^2$ ✓ ~~m^2~~

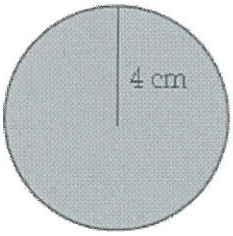
(c)



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

$=$ $\frac{1}{2} \times 4.7 \times 6.2 = 14.57$ m^2 ✓

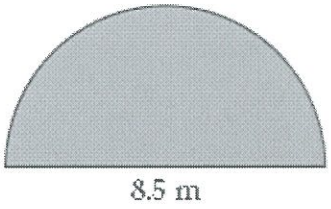
(d)



Area $= \pi r^2$

$=$ $\pi \times 4^2 = 50.3$ cm^2 ✓ 1dp.

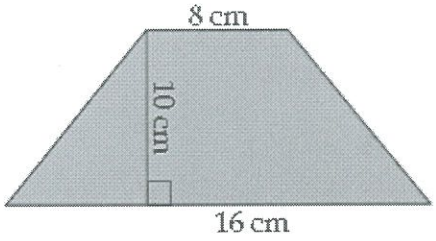
(e)



Area $= \frac{1}{2} \times \pi \times$ 4.25 ^{2} ✓

$=$ 28.9 m^2 (1dp) ✓ [2 marks]

(f)



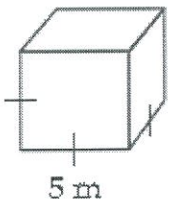
Area $= \frac{1}{2} \times$ 10 $\times$ (8 + 16) ✓

$=$ 120 cm^2 ✓ [2 marks]

Question 4

Find the surface area of each prism.

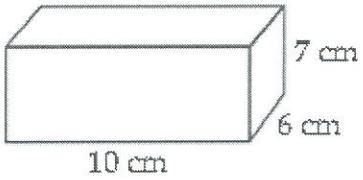
(a)



Surface Area $= 6s^2$

$=$ $6 \times 5^2 = 150$ cm^2 ✓

(b)



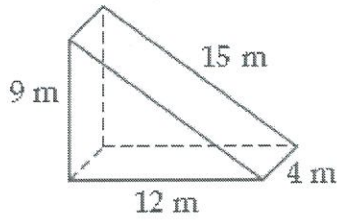
Surface Area

$= 2 \times [(10 \times 6) + (10 \times 7) + (\underline{6} * \underline{7})]$

130 4*

$= \underline{344}\ cm^2$ [2 marks]

(c)



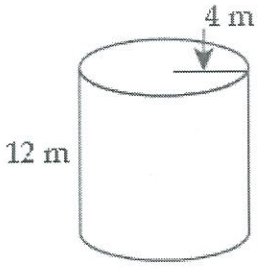
Surface Area

$= (2 \times \frac{1}{2} \times 12 \times \underline{9}) + (12 \times 4) + (9 \times 4)$

$+ (15 \times 4)$

$= \underline{252}\ m^2$ [2 marks]

(d)



Surface Area

$= (2\pi \times 4^2) + (\underline{2\pi} \times 4 \times 12)$

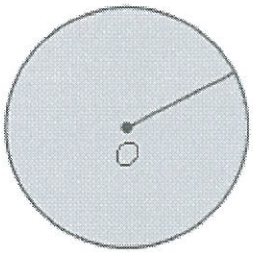
$= \underline{402.1}\ m^2$ [2 marks]

(1dp).

Question 5

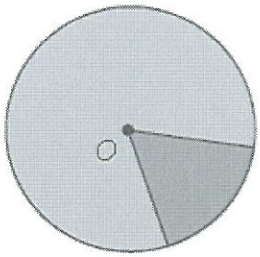
Write the name of each circle part.

(a)



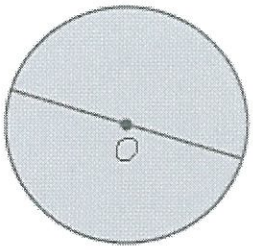
Radius

(b)



Sector

(c)

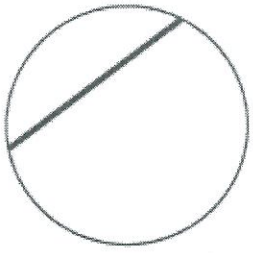


Diameter

(d)

Arc

(e)



Chord

END OF TEST