Student Name: _____	**Grade**: _____
Date: _____	**Score**: _____

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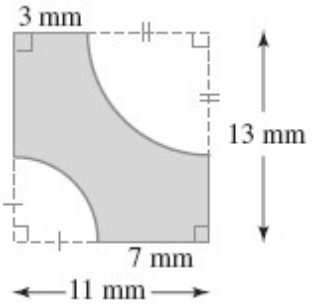
1 Year 8 Term 4 Week 2 Homework

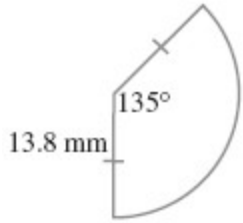
1.1 Circles and Cylinders

1.1.1 Circumference of a circle

Exercise 1.1.1 Find in term of π the exact perimeter of each figure:

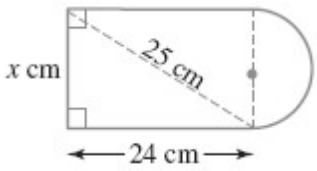


1. *Perimeter =*



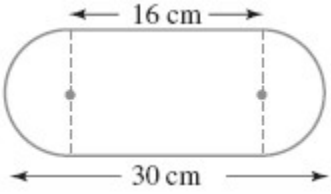
2. *Perimeter =*

3. *Find the value of x and hence calculate the perimeter of the figure.*

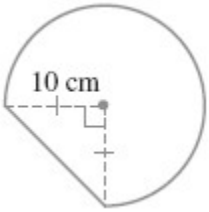


1.1.2 Area of a circle

Exercise 1.1.2 Find the total area in each of these, correct to 1 decimal place.

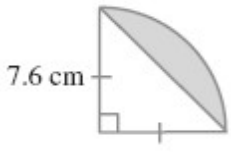


1. *Area =* _____



2. *Area =* _____

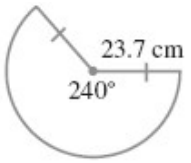
3. *Find the area of shaded part. Area =* _____



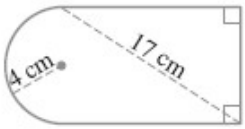
1.1.3 Area of a sector

Exercise 1.1.3 Find the area of each of the following figures:

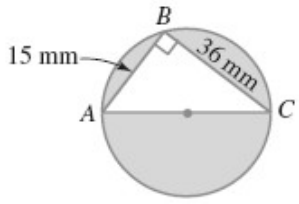
1. *Calculate the area of the sector, correct to 2 decimal places.*



2. *Find the area in terms of π.*



3. *Find the length of the diameter AC and hence find the shaded area of the figure, correct to 1 decimal place.*



1.1.4 Volume of a cylinder

The volume of a cylinder is given by the formula:

$$V = \pi r^2 h$$

where **r** is the length of the radius and **h** is the height of the cylinder.

Exercise 1.1.4 Find, correct to 1 decimal place, the volume of a cylinder with:

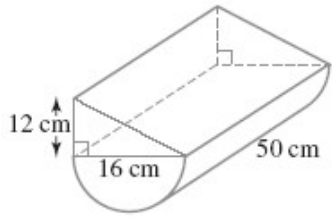
1. *radius 21 mm and height 8.5 mm*

2. *radius 3.5 cm and height 7.1 cm*

3. *diameter 12.5 cm and height 15.4 cm*

4. *diameter 18 mm and height 15.4 mm*

Exercise 1.1.5 Calculate the total volume of following figure, correct to 2 decimal places.



1.2 Linear relationships

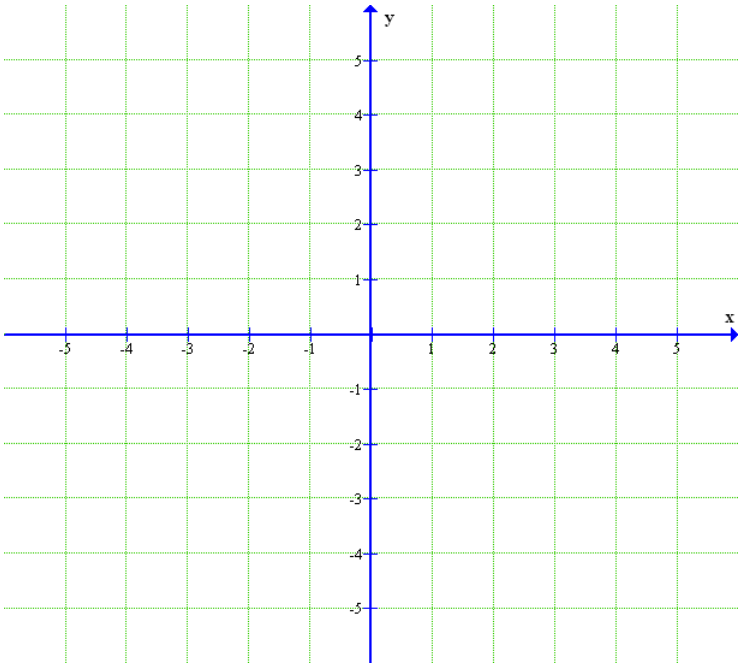
1.2.1 The number plane

- The number plane is divided into four quadrants by two perpendicular lines called the x-axis and the y-axis.
- The position of a point if given as an ordered pair or a pair of co-ordinates (x, y)

Exercise 1.2.1 Write down the co-ordinate of the point that is:

1. *4 unit above (-3, -5)* _____
2. *6 unit to the right of (-4, -1)* _____
3. *5 unit below (-3, 2)* _____
4. *7 unit left of (0, 3)* _____

Exercise 1.2.2 Plot the points E(1, 2), F(1, 5), G(4, 5) and H(4, 2) on a number plane, then join the points to form a quadrilateral.

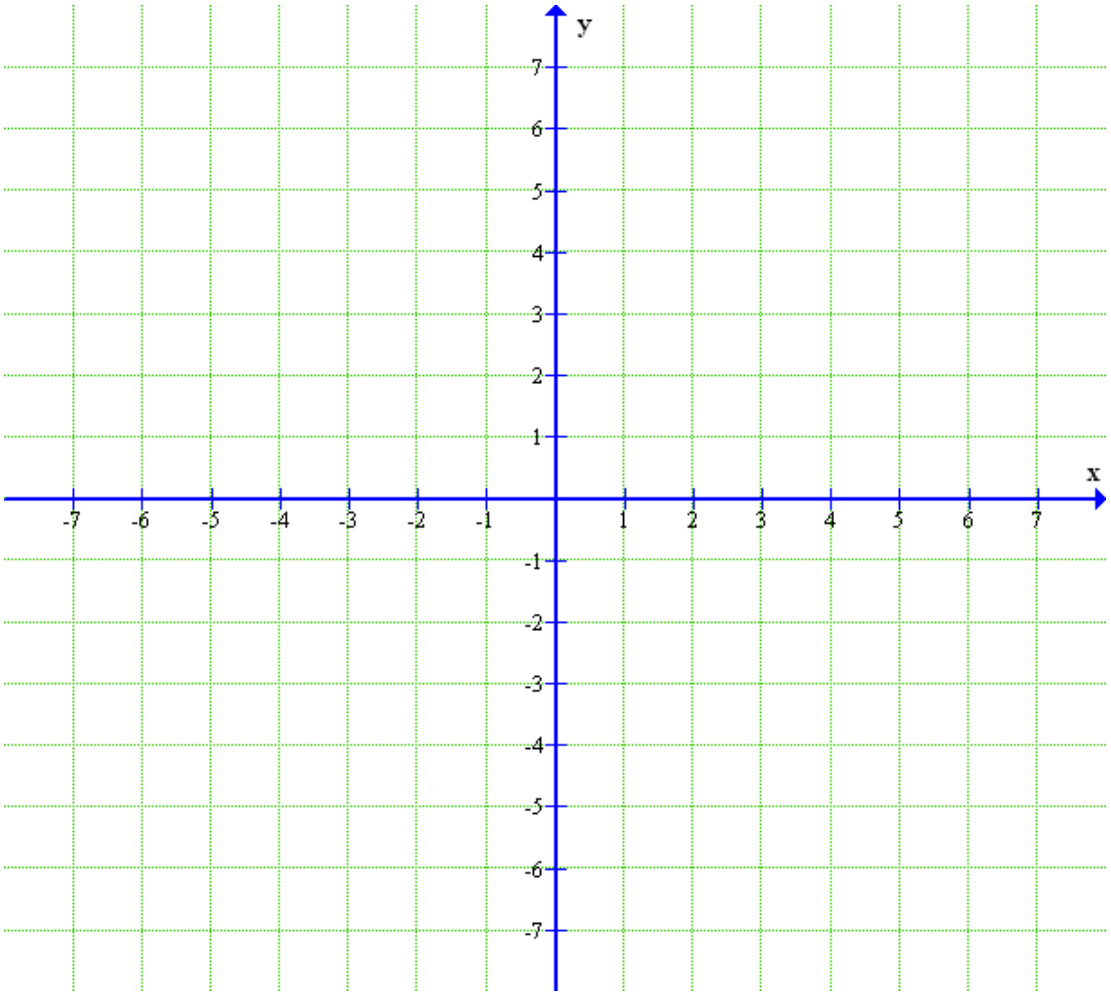


1. *What kind of figure is EFGH?* _____
2. *Find the perimeter of the quadrilateral EFGH.*

_____

_____

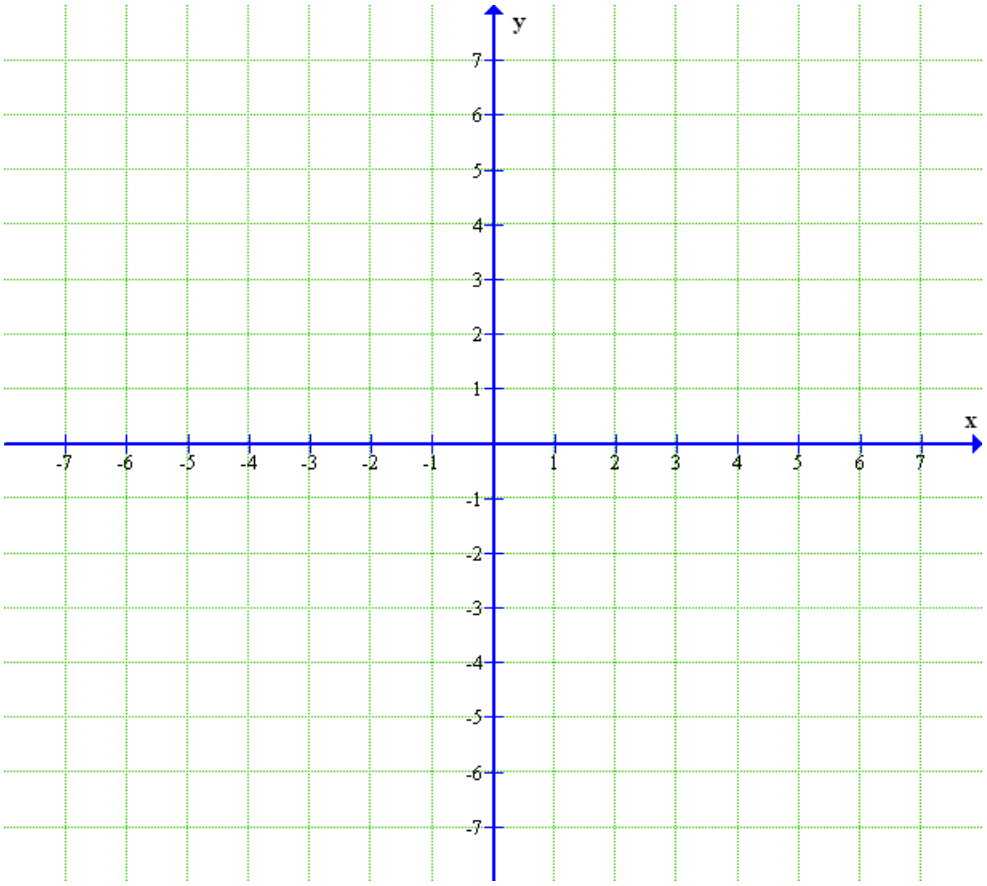
Exercise 1.2.3 Plot the points A(5, 5), B(1, 3) and C(7, 3) on a number plane, then join A to B and B to C.



1. *Find the co-ordinates of point D such that ABCD is a parallelogram.*

2. *Join the diagonals and write down the co-ordinate of their points of intersection.*

Exercise 1.2.4 Plot the points A(1, 7), B(6, 4), and C(1, -5) on a number plane, then join the points to form a triangle.



1. *Find the length of the base AC.*

2. *Find the height of* $\triangle ABC$

3. *Hence, calculate the area of* $\triangle ABC$

1.2.2 Straight line graphs

To draw the graph of a straight line:

- draw a table with at least three x values
- substitute each x value from the table into the equation to find the corresponding y value
- plot the points on a number plane
- draw a line through the points, with an arrow at each end.
- label the axes and the graph.

Exercise 1.2.5 Complete each table of values, then graph the equations on the same number plane.

1. $y = 2x$

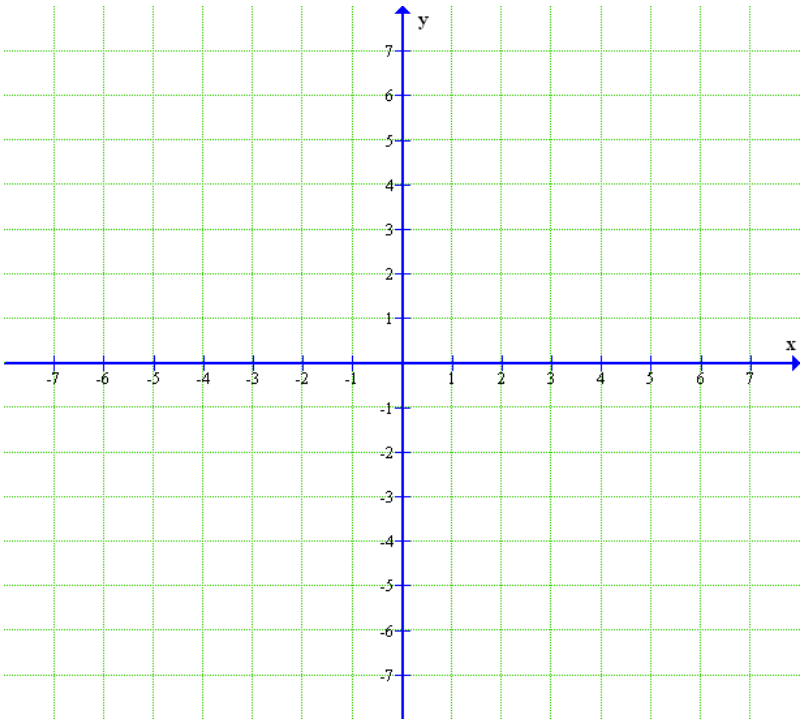
x	-1	0	1	2
y				

2. $y = 2x+2$

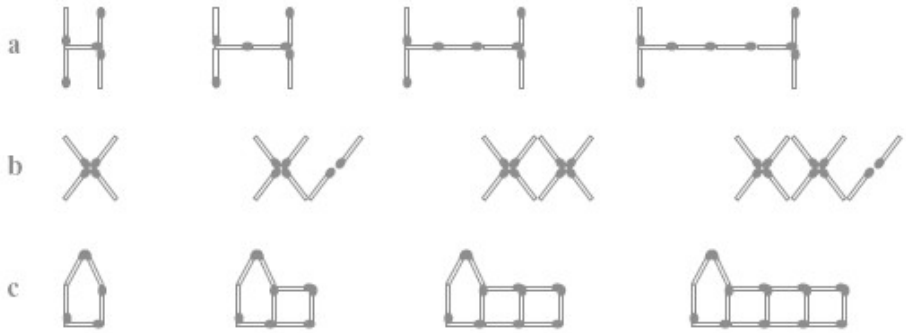
x	-2	-1	0	1
y				

3. $y = x-1$

x	-1	0	1	2
y				



Exercise 1.2.6 Write in words a rule that describes the number of matches needed to form each step in each of these following patterns.



a *How many matches would be needed to form the figure in step 20?*

b *How many matches would be needed to form the figure in step 50?*

c *How many matches would be needed to form the figure in step 100?*

To determine whether a point lies on a given line:

- substitute the co-ordinates of the point into the equation of the line
- if the co-ordinate satisfy the equation, then the point lies on the line.

Exercise 1.2.7 Which point(s) lie on the given line?

1. $y = 5x + 3$*; A (2. 13) and B (1, 9)*
2. $y = 3x - 2$*; A (-1, -4) and B (0, 1)*
3. $y = 2 - 3x$*; A (-2, 8) and B (2, 4)*

1.3 Miscellaneous Exercise

Exercise 1.3.1

1. *Solve the following equations:*

   (a) $\frac{2x-1}{3} = 5x + 2$

   (b) $3(2x - 5) - 2(x + 3) = 12$

2. *In a certain school the ratio of boys to girls is 12:17. If there are 75 more girls than boys, what is the total number of students in the school?*

3. *A bag contains 4 red, 6 yellow and 5 green marbles. If a marble is picked at random from the bag, what is the probability of selecting:*

   (a) a yellow marble?

   (b) a green or a red marble?

   (c) first green and second red marbles?

4. *Given that* $F = \frac{mv^2}{r}$*, find the value of m when F = 24, v = 4 and r = 8.*

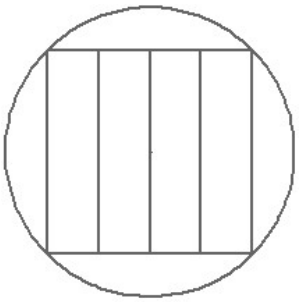
5. *In a class of less than 40 students there are exactly 20% more girls than boys. How many girls are there?*

1.4 Maths Challenge

Exercise 1.4.1

1. *If* $\frac{a-b}{a+b} = \frac{3}{7}$*, what is the value of* $\frac{a^3}{b^3}$*?*

2. *The figure shown below is a square circumscribed by a circle. If this square is divided into four equal rectangles and each rectangle has perimeter 25 cm, find the area of the circle, give your answer in term of* π*.*



3. *The figure shown below is a semi-circle and 2 quarters of circle inside a 12 cm by 6 cm rectangle. If the total area of the shaded part is* $\pi x\ cm^2$*, what is the value of x?*