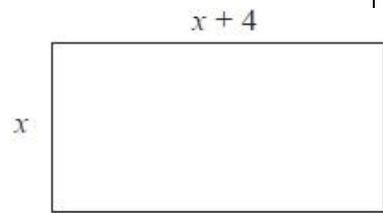


Year 9 Higher Revision

Q1. The diagram shows a rectangle.

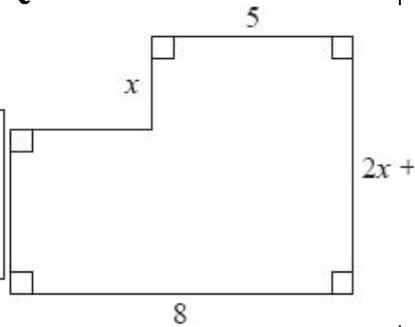


All measurements are given in centimetres. The perimeter of the rectangle is 45 cm. Work out the value of x .

$x =$
.....
.....

(Total for question = 3 marks)

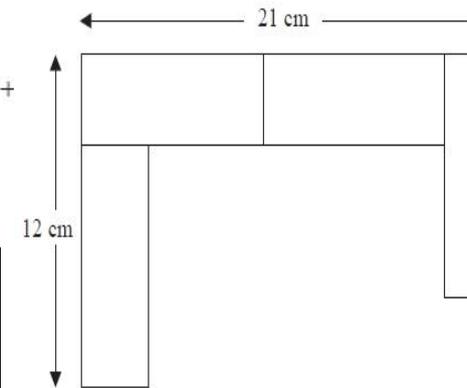
Q2.



Here is a shape. All the measurements are in metres. The area of the shape is $A \text{ m}^2$. Find a formula for A in terms of x .

(Total for question = 3 marks)

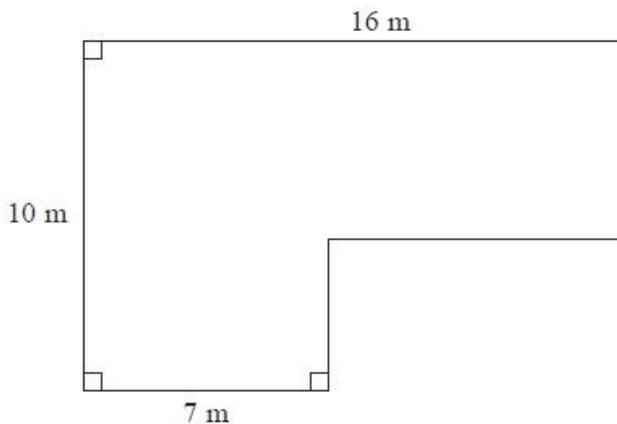
Q5. A pattern is made using four identical rectangular tiles.



Find the total area of the pattern.

(Total for question = 5 marks)

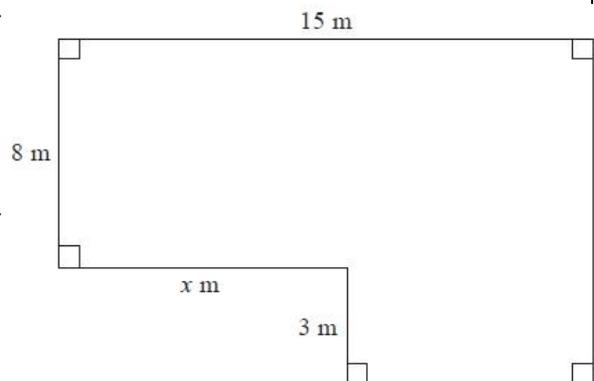
Q3. The diagram shows the plan of a small field.



Kevin is going to keep some pigs in the field. Each pig needs an area of 36 square metres. Work out the greatest number of pigs Kevin can keep in the field.

(Total for Question is 4 marks)

Q4. The diagram shows the plan of a floor.

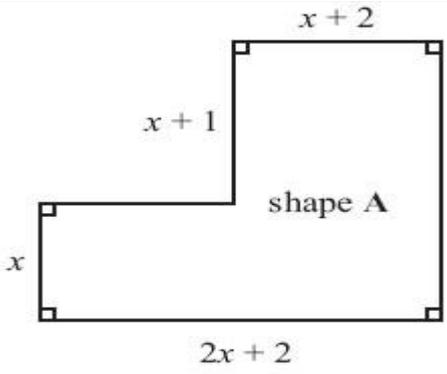


The area of the floor is 138 m^2 . Work out the value of x .

(Total for Question is 4 marks)

Challenge

The diagram shows shape **A**. All the measurements are in centimetres.



(a) Find an expression in terms of x for the area, in cm^2 , of shape **A**.
You must simplify your answer.

.....
(4)

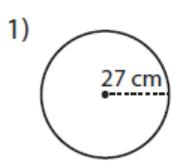
Shape **B** is a rectangle.
Shape **B** has the same area as shape **A**.
Shape **B** has a length of $(3x + 2)$ centimetres.

(b) Find an expression in terms of x for the width, in centimetres, of shape **B**.

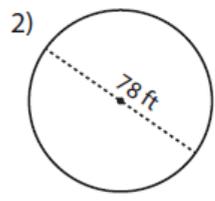
.....
(1)

(Total for Question is 5 marks)

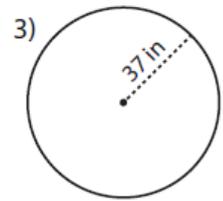
**Calculating the area of circle and using area to work out functional questions.
(Total for Question is 14 marks)**



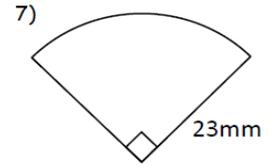
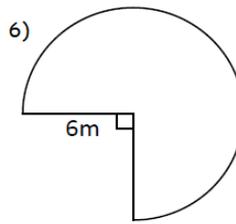
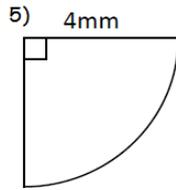
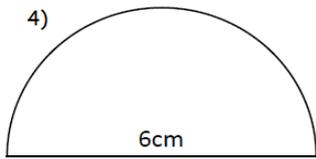
Radius = _____
Diameter = _____
Area = _____
Circumference = _____



Radius = _____
Diameter = _____
Area = _____
Circumference = _____



Radius = _____
Diameter = _____
Area = _____
Circumference = _____



Radius = _____

Radius = _____

Radius = _____

Radius = _____

Diameter = _____

Diameter = _____

Diameter = _____

Diameter = _____

Area = _____

Area = _____

Area = _____

Area = _____

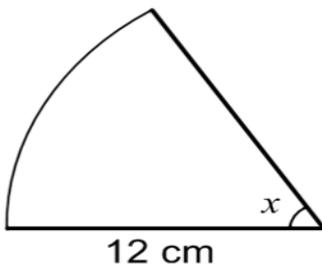
Circumference = _____

Circumference = _____

Circumference = _____

Circumference = _____

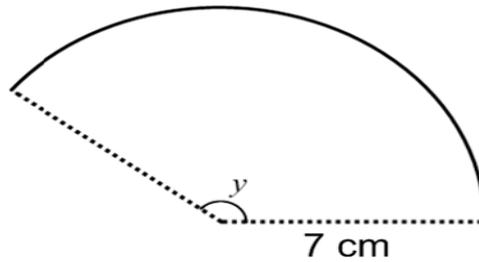
Extension



The area of this sector is 72.9cm^2

Work out the size of angle x .

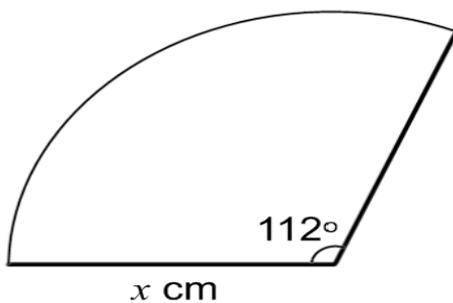
Give your answer to the nearest degree.



The length of the arc is 17.3 cm

Work out the size of angle y .

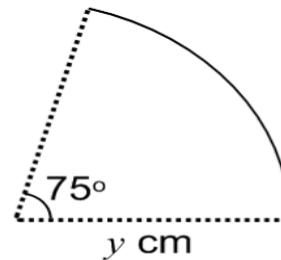
Give your answer to the nearest degree.



The area of this sector is 12.7 cm^2

Work out length x .

Give your answer to the one decimal place.



The length of the arc is 19.6 cm

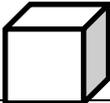
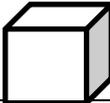
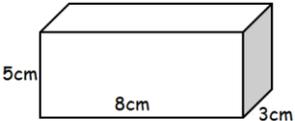
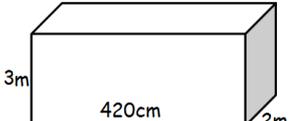
Work out length y .

Give your answer to one decimal place.

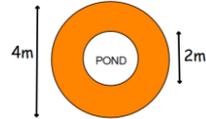
Problem solving Area and Perimeter

| | |
|---|---|
| <p>8) Tom wants to turf a circular area of his garden, the turf costs £4 per square metre. If the circular area has a radius of 6m, work out the total cost.</p> | <p>9) Mary wants to brick a circular area of her pond. A pack of bricks cost £10.50 and covers 20 square metres. If the circular area has a radius of 21m, work out the total cost.</p> |
| <p>10) Emma is varnishing the floor of a circular room with diameter 8m. One tin of varnish will cover an area of 3m². How many tins of varnish will she need to buy to varnish the floor of the room?</p> | <p>11) Sue wants to paint a large circle in the school playground. The circle needs to have a radius of 5m. One tin of paint covers 10m² and costs £9.95. How much will it cost to paint the circle?</p> |
| <p>12) Mo wants to paint a large circle in the school playground. The circle needs to have a radius of 7m. One tin of paint covers 15m² and costs £7.95. How much will it cost to paint the circle?</p> | <p>13) Janine has a pond in her garden (diameter 10m) and wants to buy flowers to go around the edge of her pond. It costs £3 per metre. How much will it cost?</p> |

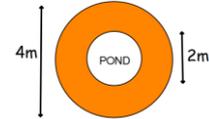
Success Criteria 5: To be able to apply reasoning skills to volume functional questions

| | |
|--|---|
| <p>1. A solid gold cube has sides of 7cm. Gold costs £1.45 per cm³. What is the cost of the solid gold cube?</p>  | <p>2. A solid gold cube has sides of 8cm. Gold costs £1.45 per cm³. What is the cost of the solid gold cube?</p>  |
| <p>3. A solid silver cuboid has sides of 5cm, 8cm and 3cm. Silver costs £0.75 per cm³. What is the cost of the solid silver cuboid?</p>  | <p>4. A solid silver cuboid has sides of 3m, 420cm and 2m. Silver costs £0.75 per m³. What is the cost of the solid silver cuboid?</p>  |
| <p>5. Small stones are to be put down to make</p> | <p>6. Small stones are to be put down to make</p> |

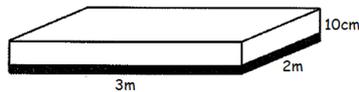
a circular path around this pond. The path needs to be 50cm deep. A bag of stones covers 2m^3 and costs £5. How much will this job cost?



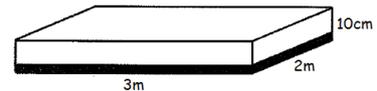
a circular path around this pond. The path needs to be 20cm deep. A bag of stones covers 5m^3 and costs £8.95. How much will this job cost?



7. Jack wants to buy some peat to top up his flower bed (shown below). The peat comes in bags of 200,000 cubic centimetres. Given that his soil is already 2cm high, how many bags of peat will he have to buy?



8. Jo wants to buy some peat to top up his flower bed (shown below). The peat comes in bags of 100,000 cubic centimetres. Given that his soil is already 3cm high, how many bags of peat will he have to buy?

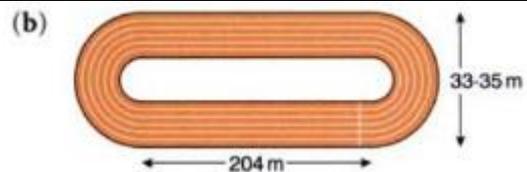
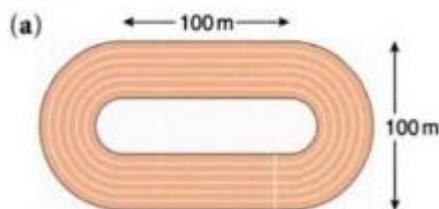


9. Bonnie has a solid gold cube, with sides of 5cm. His dad melts it into a solid gold sphere. What will be the radius of the sphere? Volume of Sphere = $\frac{4}{3}\pi r^3$

10. Bonnie has a solid gold cube, with sides of 4cm. His dad melts it into a solid gold sphere. What will be the radius of the sphere? Volume of Sphere = $\frac{4}{3}\pi r^3$

Mastered- style Questions

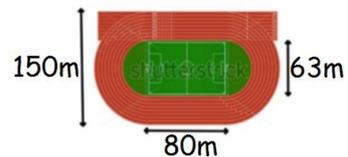
1. Calculate the perimeter of each athletics track



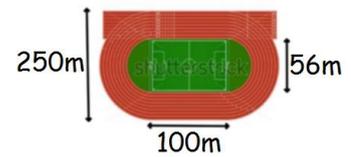
2. What is the difference in perimeter

3. What is the difference in perimeter

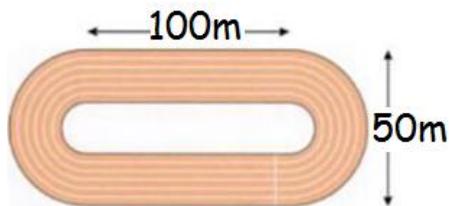
between the outside and inside lanes of this athletics track?



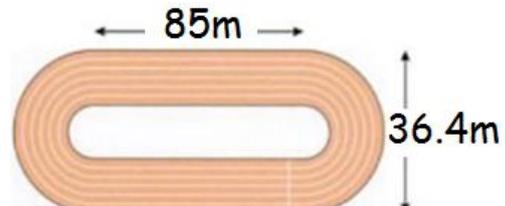
between the outside and inside lanes of this athletics track?



4. An athletics track has 6 lanes each 1.25 metres wide. Calculate the difference in length between the inside and outside edges of the track.



5. An athletics track has 6 lanes each 1.25 metres wide. Calculate the difference in length between the inside and outside edges of the track.



RECIPROCAL GRAPHS

Part 1 – What is a reciprocal?

Match each number in the table below with its reciprocal, calculating the reciprocal of the numbers that don't match:

| | | | | | | |
|---|---------------|---------------|---------------|---------------|------|-------|
| 2 | $\frac{1}{5}$ | 10 | $\frac{9}{7}$ | $\frac{2}{3}$ | 1.25 | 0.375 |
| | | | | | | |
| | 5 | $\frac{7}{9}$ | $\frac{1}{2}$ | 0.8 | 1.5 | |

What is the reciprocal of x ?

What about the reciprocal of $3x$?

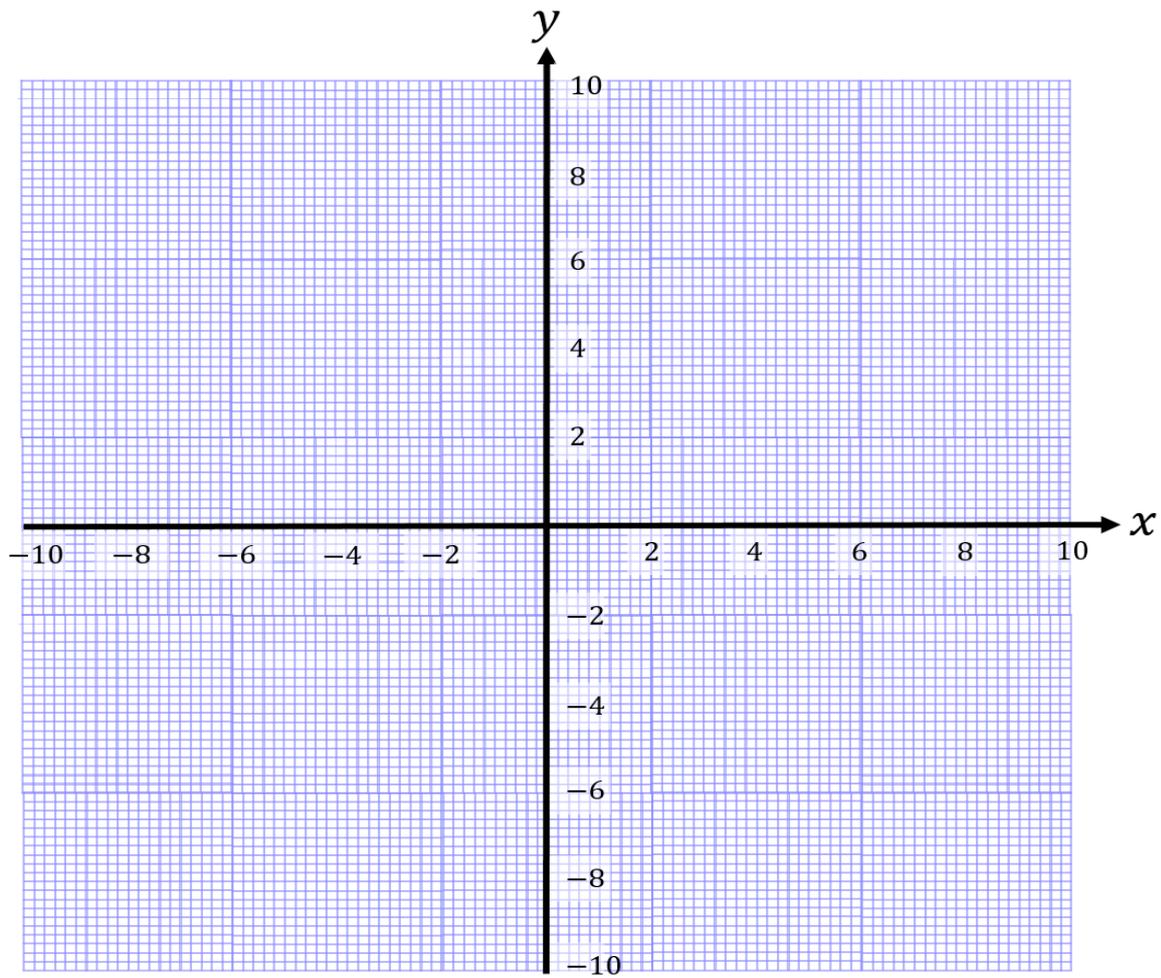
And $x + 2$?

Part 2 – Can I find coordinates on a reciprocal graph?

Fill in the table and draw the graph of $y = \frac{1}{x}$

| | | | | | | | | | |
|---|----|----|----------------|----------------|---|---------------|---------------|---|---|
| X | -2 | -1 | $-\frac{1}{2}$ | $-\frac{1}{4}$ | 0 | $\frac{1}{4}$ | $\frac{1}{2}$ | 1 | 2 |
| Y | | | | | | | | | |

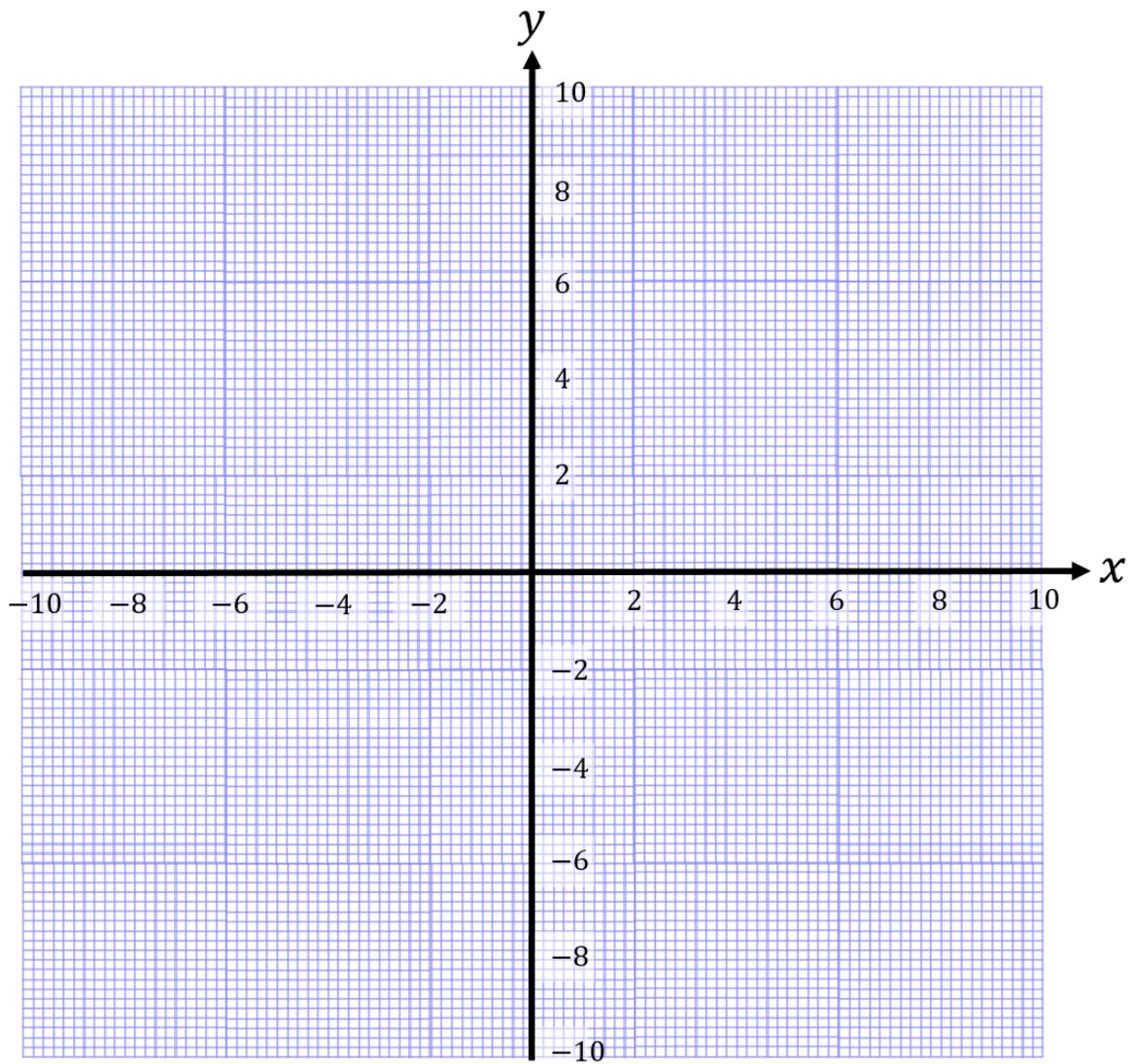
Workings:



Fill in the table and draw the graph of $y = \frac{2}{x}$

| | | | | | | | | | | | | | |
|---|----|----|----|----|----------------|----------------|---|---------------|---------------|---|---|---|---|
| X | -8 | -4 | -2 | -1 | $-\frac{1}{2}$ | $-\frac{1}{4}$ | 0 | $\frac{1}{4}$ | $\frac{1}{2}$ | 1 | 2 | 4 | 8 |
| Y | | | | | | | | | | | | | |

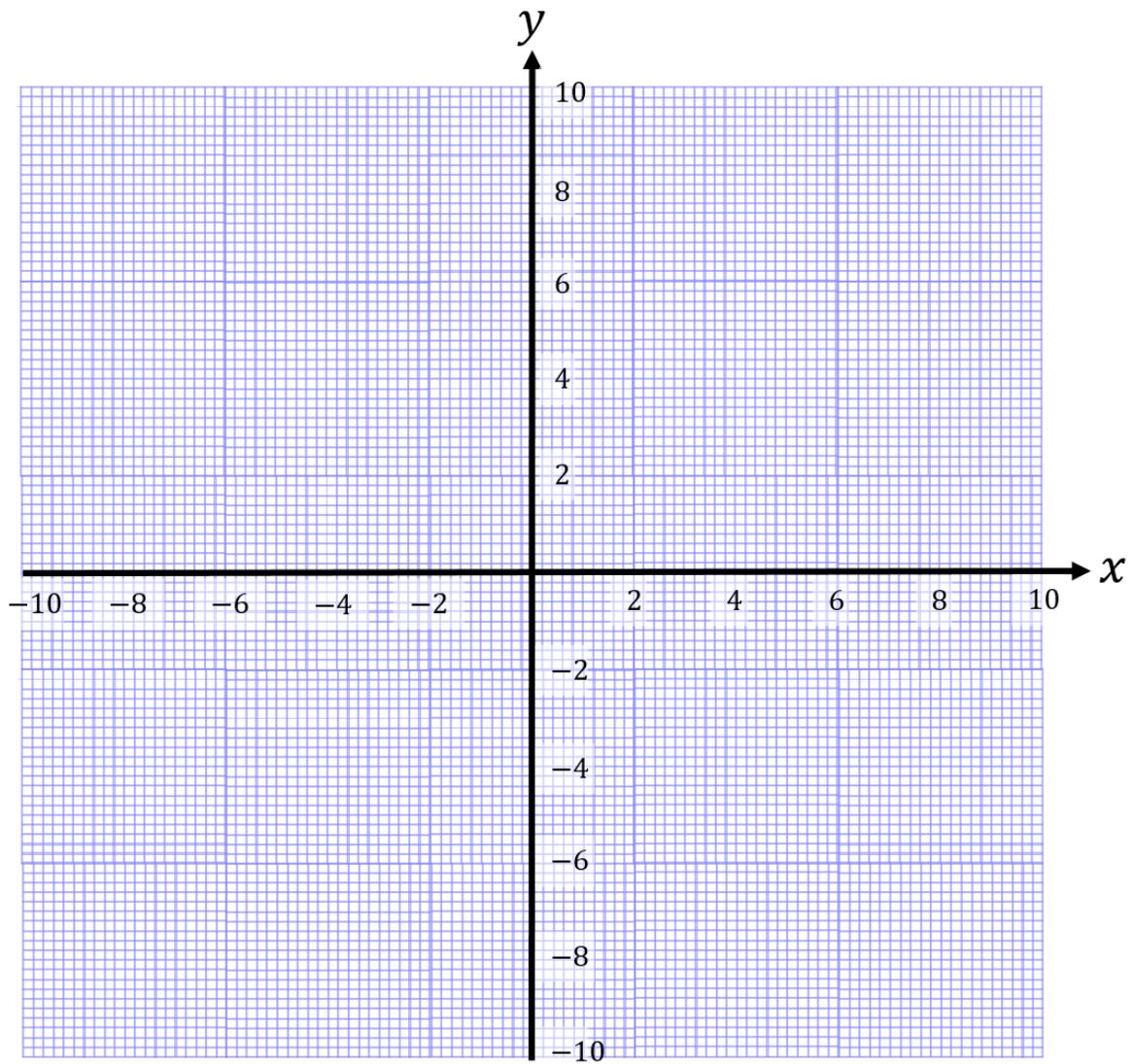
Workings:



Fill in the table and draw the graph of $y = \frac{1}{2x}$

| | | | | | | | | | |
|---|----|----|----------------|----------------|---|---------------|---------------|---|---|
| X | -2 | -1 | $-\frac{1}{2}$ | $-\frac{1}{4}$ | 0 | $\frac{1}{4}$ | $\frac{1}{2}$ | 1 | 2 |
| Y | | | | | | | | | |

Workings:

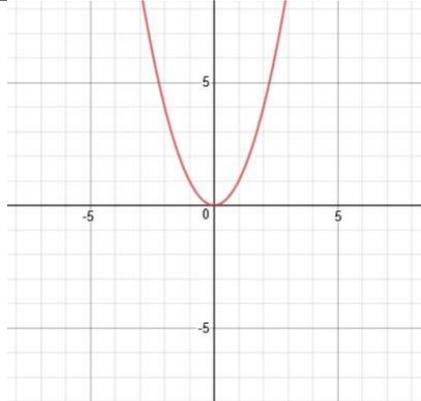
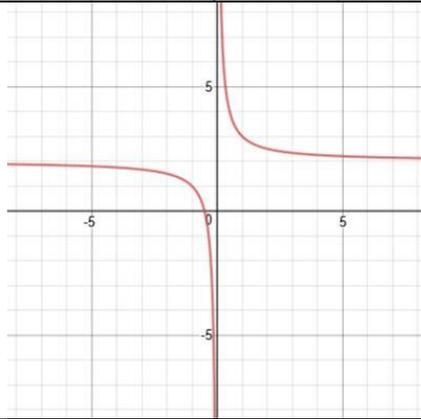
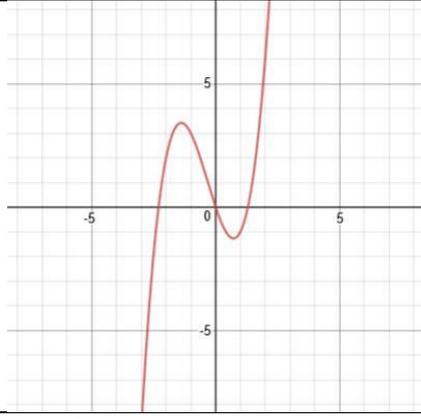
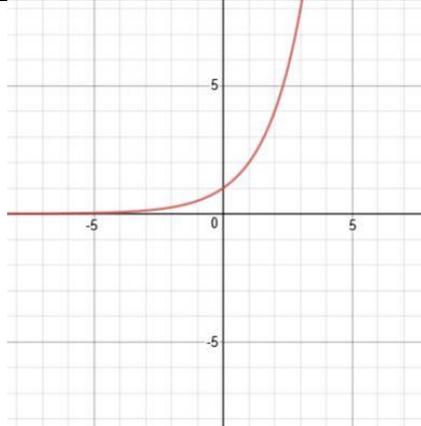


Part 3 – Can I recognise a reciprocal graph?

Which of these is a reciprocal graph?

Explain how you know whether they are or aren't reciprocal graphs:

| | Graph | Reciprocal or not? | How can you tell? |
|---|-------|--------------------|-------------------|
| A | | | |

| | | | |
|-------|---|-------------------|--|
| B |  | | |
| C |  | | |
| D |  | | |
| Graph | Reciprocal or not? | How can you tell? | |
| E |  | | |

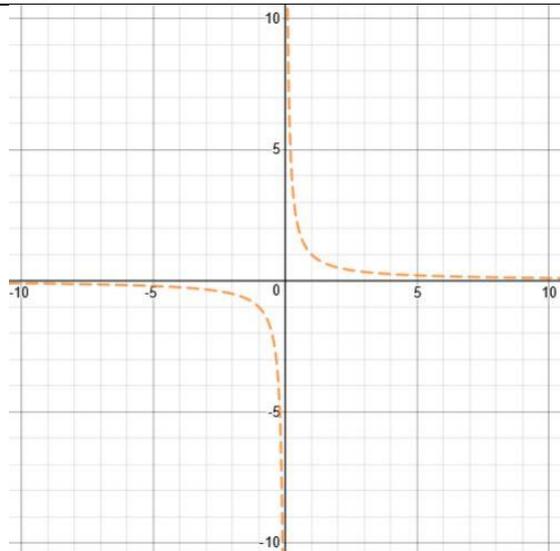
| | | | |
|---|--|--|--|
| F | | | |
| G | | | |
| H | | | |

Part 4 – Can I describe how to transform a reciprocal graph?

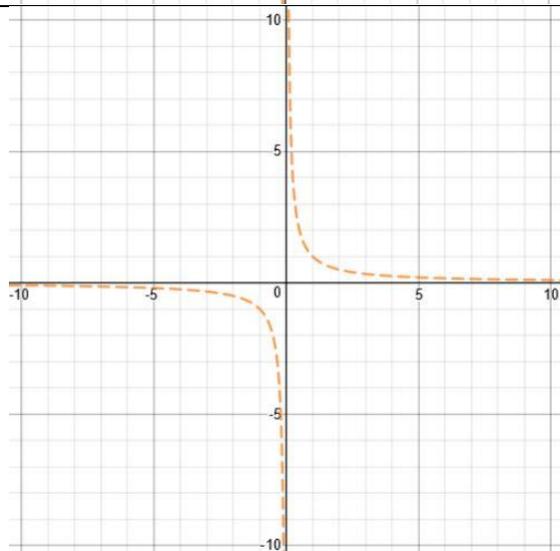
Plot the graphs below; on each grid the graph of $y = \frac{1}{x}$ is drawn to help you describe what has happened.

| | | |
|--------|---------------------|---------------------------|
| Graph: | What it looks like: | Describe what's happened: |
|--------|---------------------|---------------------------|

$$y = \frac{1}{x} + 2$$



$$y = \frac{1}{x+2}$$



$$y = \frac{1}{x-3}$$

