

Mixed Algebra – Yr11

1) Dario is using trial and improvement to find a solution to the equation

$$x + \frac{1}{x} = 5$$

The table shows his first trial.

x	$x + \frac{1}{x}$	Comment
4	4.25	Too low

Continue the table to find a solution to the equation

Give your answer to 1 decimal place.

Answer $x =$

(Total 4 marks)

2) Solve the equation $3x^2 - 5x - 7 = 0$

Give your answers to 2 decimal places.

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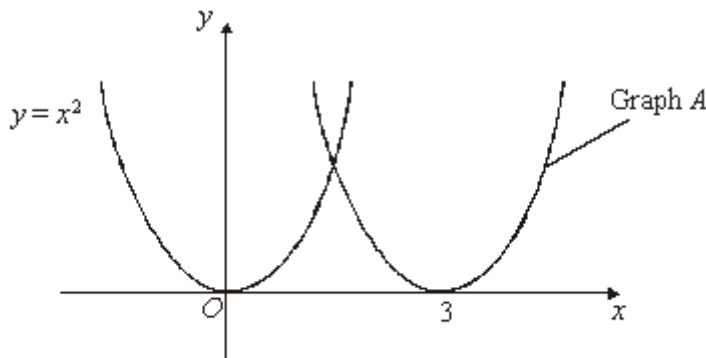
Answer

(Total 3 marks)

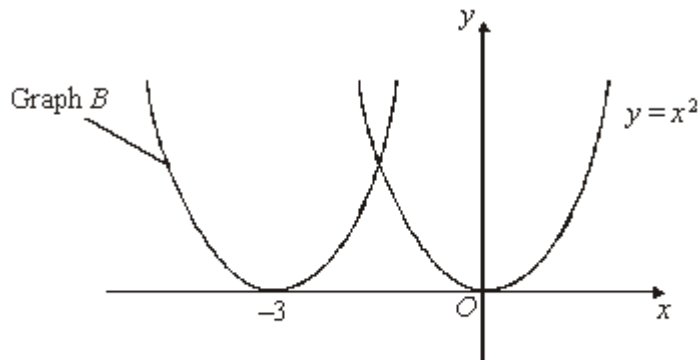
3) The diagrams, **which are not drawn to scale**, show the graph of $y = x^2$ and four other graphs *A*, *B*, *C* and *D*.

A, *B*, *C* and *D* represent four different transformations of $y = x^2$

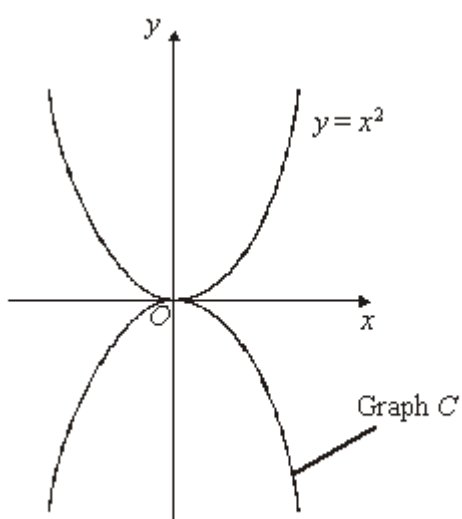
Find the equation of each of the graphs *A*, *B*, *C* and *D*.



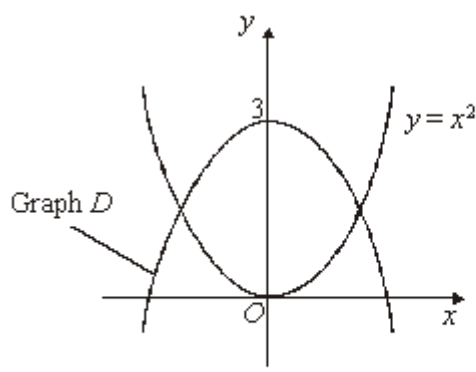
Answer Graph A is $y = \dots\dots\dots$



Answer Graph B is $y = \dots\dots\dots$



Answer Graph C is $y = \dots\dots\dots$



Answer Graph D is $y = \dots\dots\dots$

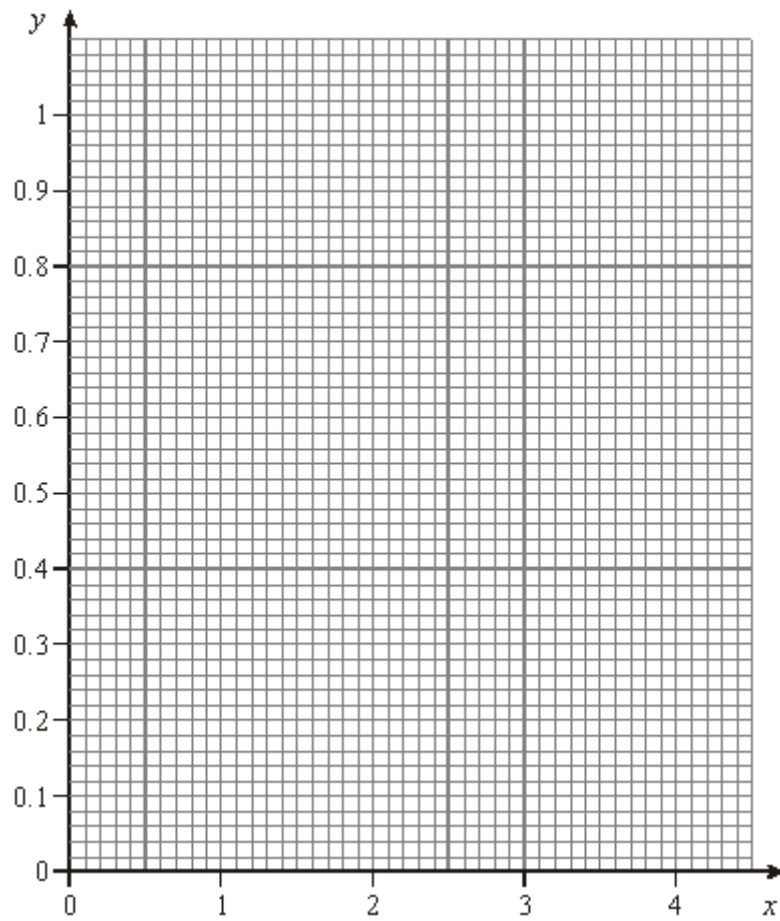
(Total 4 marks)

4) (a) Complete the table of values for $y = 0.8^x$

x	0	1	2	3	4
y	1	0.8	0.64		0.41

(1)

(b) On the grid below, draw the graph of $y = 0.8^x$ for values of x from 0 to 4.



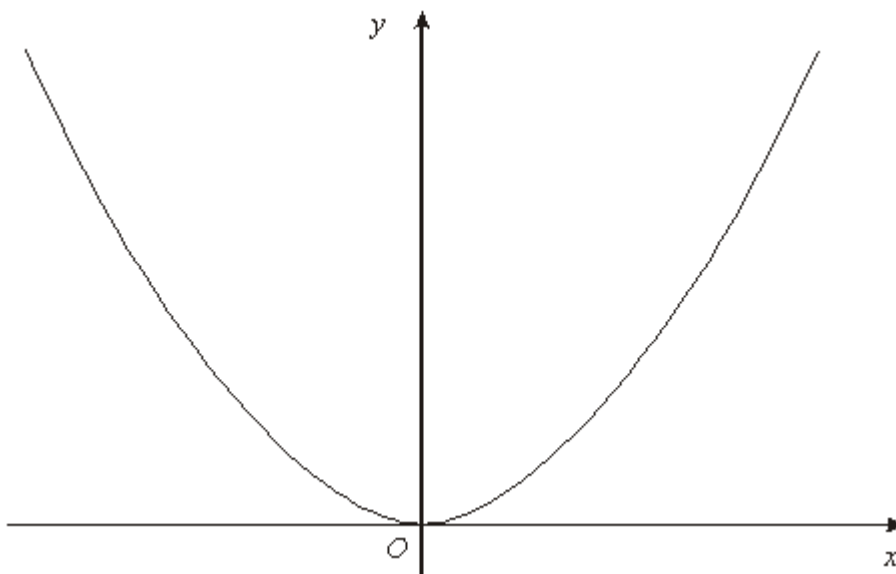
(2)

(c) Use your graph to solve the equation $(0.8)^x = 0.76$

Answer

(Total 4 marks)

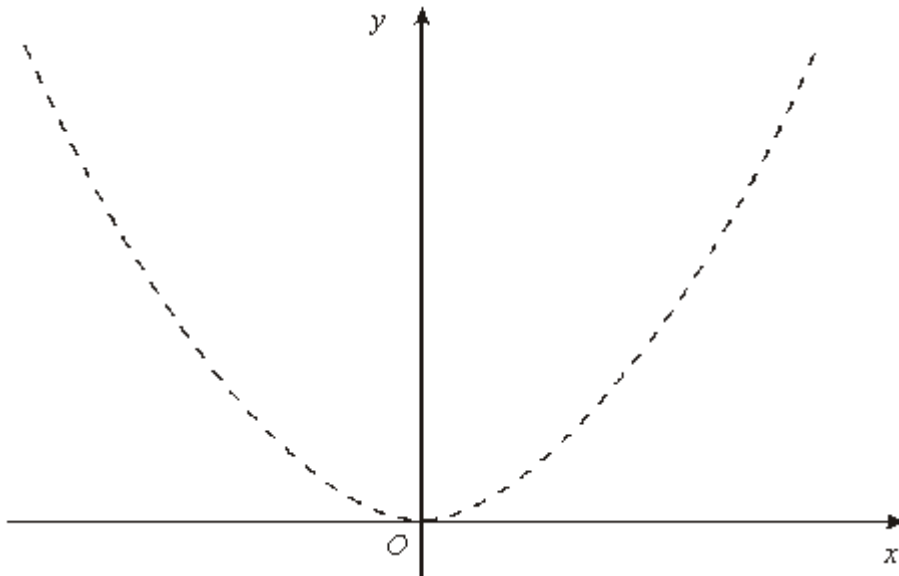
5) The sketch below is of the graph of $y = x^2$



On the axes provided, sketch the following graphs.

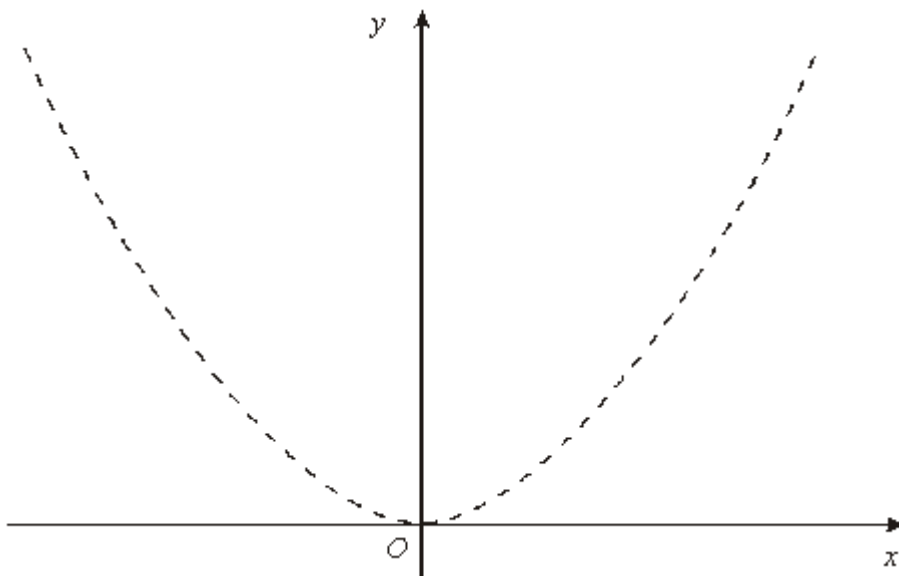
The graph of $y = x^2$ is shown dotted on each set of axes to act as a guide.

(a) $y = x^2 + 2$



(1)

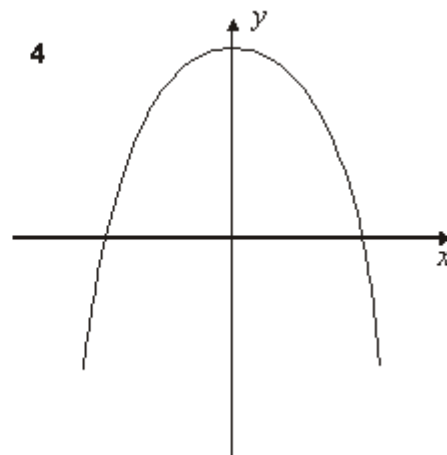
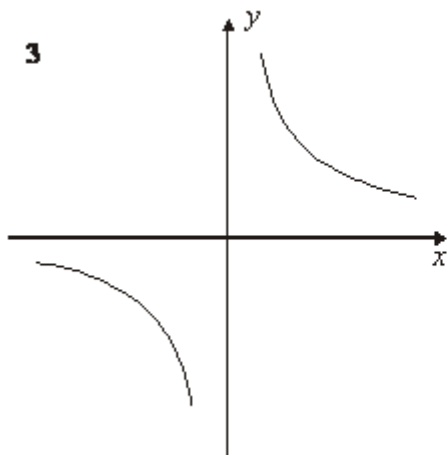
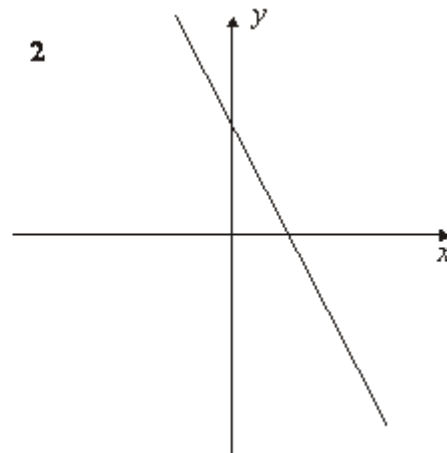
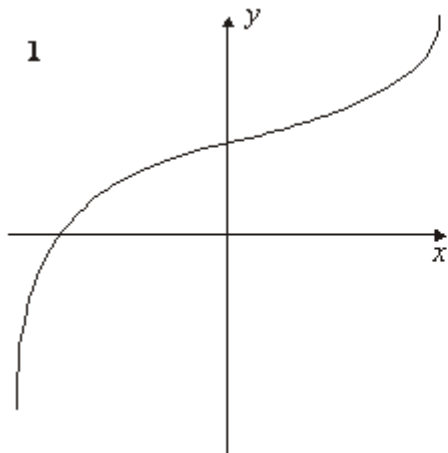
(b) $y = (x - 2)^2$



(1)

6) Match each of the sketch graphs to one of these equations.

A $y = 2 - 2x$ **B** $y = 2x + 2$ **C** $y = 3 - x^2$ **D** $y = x^3 + 4$ **E** $y = \frac{2}{x}$



Graph **1** represents equation

Graph **2** represents equation

Graph **3** represents equation

Graph **4** represents equation

(Total 4 marks)

7) (a) Show that $\frac{4}{x} = 9 - 2x$ can be written as $2x^2 - 9x + 4 = 0$

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(2)

(b) Part of the graph of $y = \frac{4}{x}$ is shown on the grid below.

Draw a straight line on the grid which will enable you to solve the equation
 $2x^2 - 9x + 4 = 0$

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(3)

(c) Hence, or otherwise, solve the equation $2x^2 - 9x + 4 = 0$

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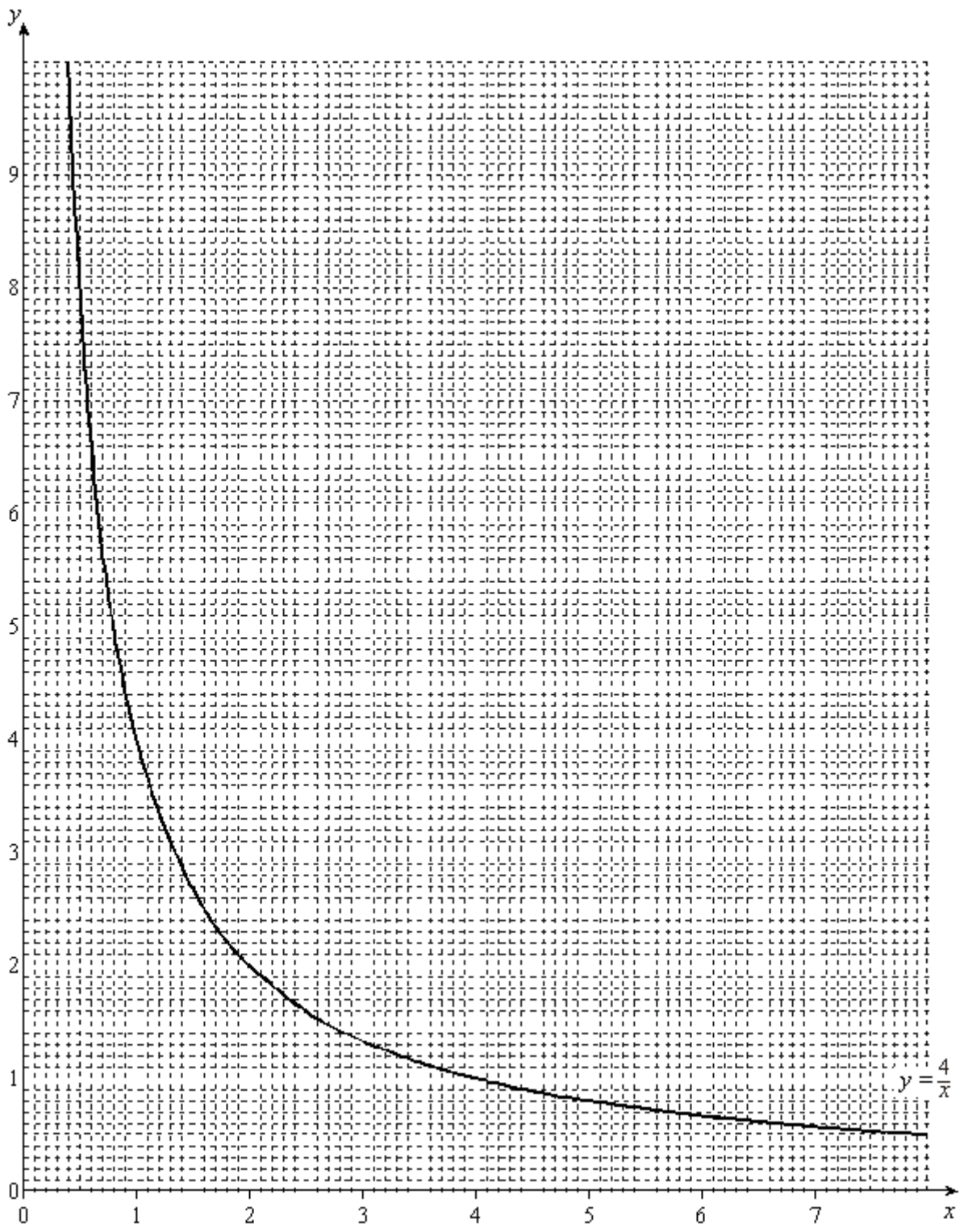
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Answer

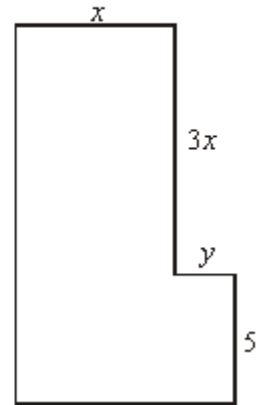
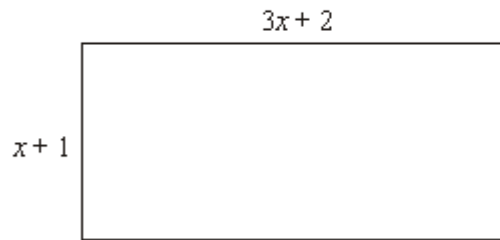
(2)



(Total 7 marks)

The diagrams show a rectangle and an L shape
All the angles are right angles.
All lengths are in centimetres.
The shapes are equal in area.

Diagrams not to scale



Calculate the value of y .