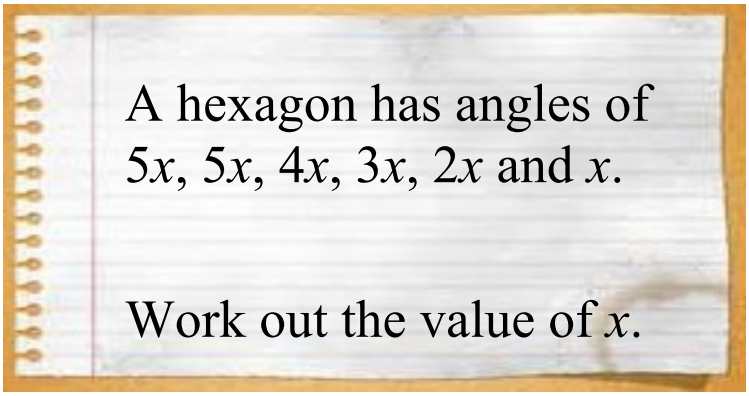
Topic Test 1 (20 minutes)

Further equations and graphs - Higher

1 A teacher asks her class to write a question that combines algebra and geometry.
This is Shana's question.



1 (a) Solve Shana's question.

[3 marks]

$x =$ _____

1 (b) Comment on the solution and Shana's question.

[1 mark]

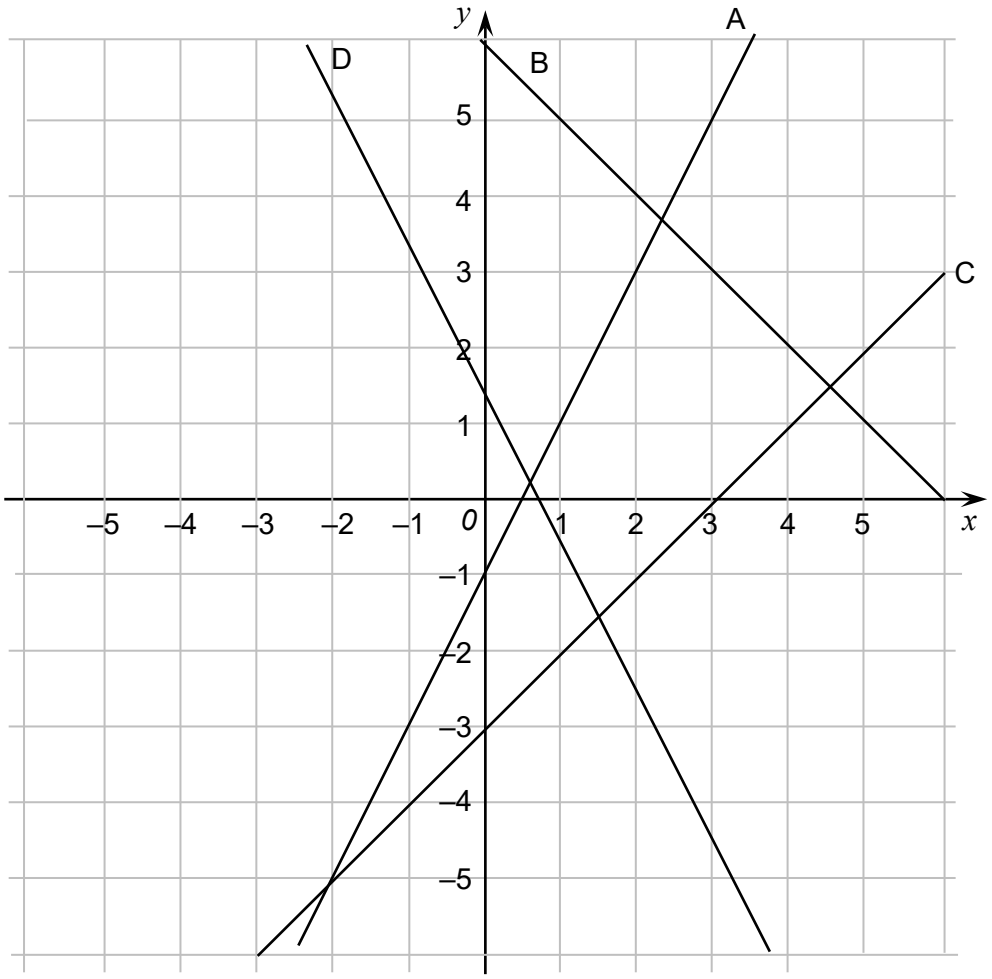
2 Here are four graphs.

Graph A: $y = 2x - 1$

Graph B: $x + y = 6$

Graph C: $y = x - 3$

Graph D: $2y + 4x = 3$



Use these graphs to write down the answers to the following problems

2 (a) I think of a number.
I multiply it by 2 and subtract 1
The answer is 4

What number did I think of?

[1 mark]

Answer _____

2 (b) The sum of two numbers is 6
The difference of the two numbers is 3

What are the two numbers?

[1 mark]

Answer _____ , _____

2 (c) $3 - 4x = 0$

Work out x.

[1 mark]

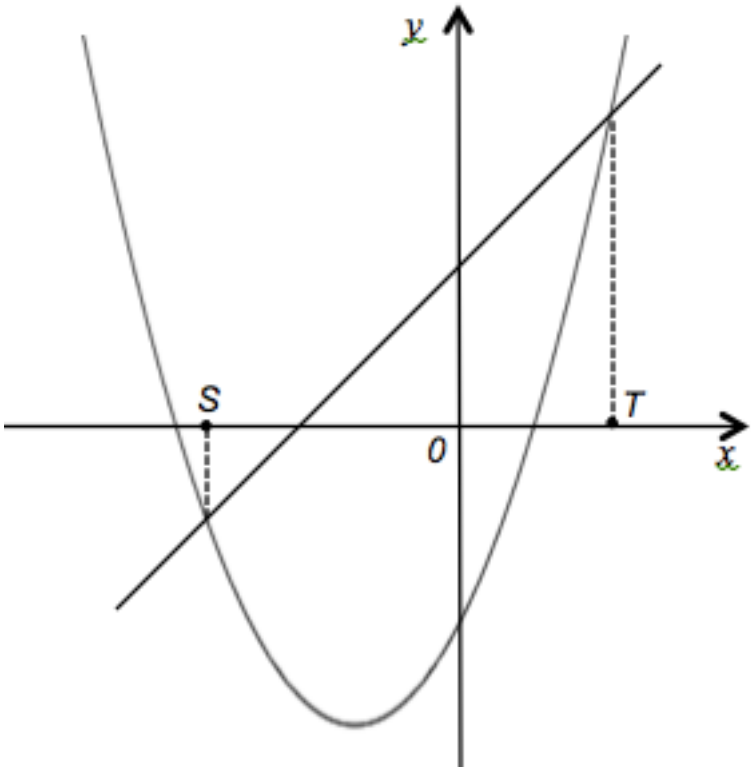
$x =$ _____

2 (d) $2x - 6 = 3 - 4x$

Work out x. **[1 mark]**

$x =$ _____

3 The sketch shows the graphs of $y = 2x + 2$ and $y = 2x^2 + 3x - 4$



Work out the x-coordinates of the points S and T.

[4 marks]

Answer _____ , _____

4 Here are four attempts to solve equations of the form $ax^2 + bx + c = 0$ using the quadratic formula.

They have all been partially evaluated.

A	B	C	D
$\frac{+8 \pm \sqrt{64 - 24}}{4}$	$\frac{-6 \pm \sqrt{64 - 24}}{4}$	$\frac{-2 \pm \sqrt{4 - 8}}{2}$	$\frac{-3 \pm \sqrt{9 + 60}}{6}$

4 (a) Three of the attempts have been correctly partially evaluated.

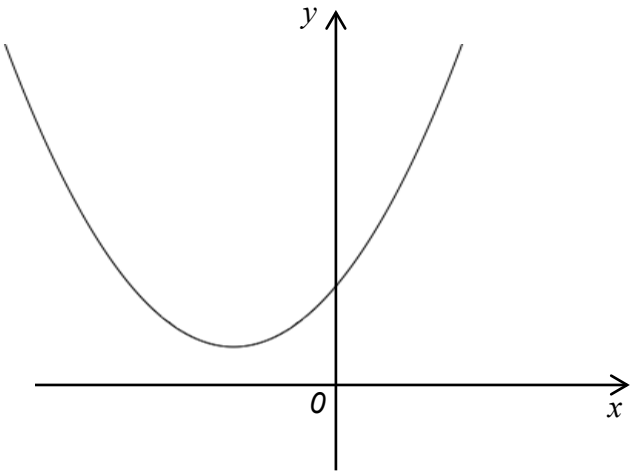
One of the attempts is wrong.

Circle the letter of the wrong attempt below.

[1 mark]

A B C D

4 (b) Here is the graph of a quadratic equation of the form $y = ax^2 + bx - c$



One attempt is the correctly partially evaluated solution of $ax^2 + bx - c = 0$ for this equation.

Circle the letter of the attempt below.

[1 mark]

A B C D

5 Solve the equation $3x^2 + 7x - 8 = 0$

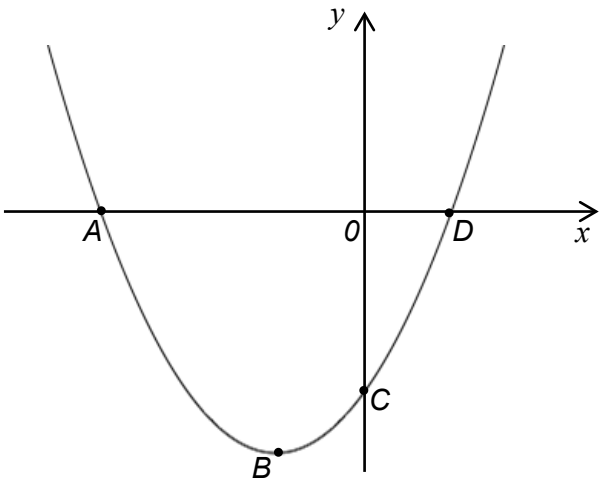
Give your answers to 2 decimal places.

[3 marks]

Answer _____

6 The equation $x^2 + 2x - 8 = 0$ can be written as $(x + 1)^2 - 9 = 0$.

Below is a sketch of the graph of $y = x^2 + 2x - 8$



Work out the coordinates of the points *A*, *B*, *C* and *D*.

[3 marks]

A (_____),(_____)

B (_____),(_____)

C (_____),(_____)

D (_____),(_____)