

Non-Calculator

Q1.

(a) Expand and simplify  $(6x - 1)(2x + 3)$

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Answer -----

(2)

(b) Solve  $4x^2 + x - 3 = 0$

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Answer -----

(3)

(Total 5 marks)

Q2.

The equation of a curve is  $y = (x + 3)^2 + 5$

Circle the coordinates of the turning point.

(5, 3)

(5, -3)

(3, 5)

(-3, 5)

(Total 1 mark)

Q3.

- (a) Show that  $x^2 - 8x + 20$   
can be written in the form  $(x - a)^2 + a$  where  $a$  is an integer.

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(3)

- (b) Hence explain how you know that  $x^2 - 8x + 20$  is always positive.

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(2)

(Total 5 marks)

Q4.

- (a) Write  $x^2 - 10x + 12$  in the form  $(x - a)^2 + b$   
where  $a$  and  $b$  are integers.

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Answer \_\_\_\_\_

(2)

- (b) When  $(x - 2)^2 + 7$  has a minimum value, what is the value of  $x$ ?  
Circle your answer.

-2                      2                      7                      11

(1)

(Total 3 marks)

## Calculator

Q5.

Solve the equation  $\frac{x}{x-2} - \frac{2x}{x+1} = 1$ . Give your solutions to 2 decimal places. You must show your working.

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Answer \_\_\_\_\_

(Total 6 marks)

Q6.

Solve the equation  $\frac{1}{x-2} - \frac{1}{x+1} = 2$ . Give your answers to 2 decimal places.

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Answer \_\_\_\_\_

(Total 6 marks)

Q7.

You are given that  $x^2 - 12x + a = (x - c)^2$

Work out the values of  $a$  and  $c$ .

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$a =$  \_\_\_\_\_

$c =$  \_\_\_\_\_

(Total 3 marks)

Q8.

(a) Write  $x^2 + 6x + 10$  in the form  $(x + a)^2 + b$

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Answer \_\_\_\_\_

(2)

(b) Hence, write down the coordinates of the turning point of the curve  $y = x^2 + 6x + 10$

Answer (....., .....) )

(1)

(Total 3 marks)

Q9.

You are given that  $(x + a)^2 - 7 \equiv x^2 + 10x + b$

Work out the values of  $a$  and  $b$ .

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$a$  =

\_\_\_\_\_ (Total 2 marks)

\_\_\_\_\_  $b$  =

\_\_\_\_\_

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Q10.

- (a) Write  $x^2 - 10x + 29$  in the form  $(x - a)^2 + b$

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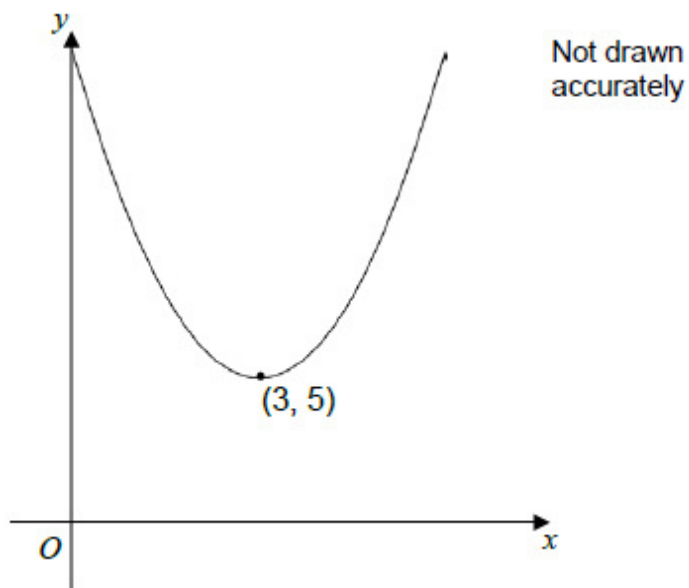
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Answer \_\_\_\_\_

(2)

- (b) A sketch of  $y = x^2 + cx + d$  is shown.

The turning point is (3, 5)



Work out the values of  $c$  and  $d$ .

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$c =$  \_\_\_\_\_  $d =$  \_\_\_\_\_

(3)

(Total 5 marks)

Q11.

Solve the equation  $\frac{6}{x+3} + \frac{1}{2x+5} = 3$ . Give your answers to 2 decimal places.

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Answer \_\_\_\_\_ and \_\_\_\_\_ (Total 6 marks)

Q12.

Solve  $5x^2 = 10x + 4$ .  
Give your answers to 2 decimal places.

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Answer \_\_\_\_\_ (Total 4 marks)