Name:

Exam Style Questions

Completing the Square

Corbettm𝛼ths

Equipment needed: Pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

Videos 10, 267a

Answers and Video Solutions

1. Write $x^2 + 8x + 6$ in the form $(x + a)^2 + b,$ where a and b are constants.

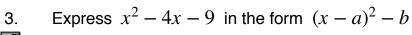.................................

(2)

2. Write $x^2 + 12x - 1$ in the form $(x + a)^2 + b$, where a and b are constants.

....

(2)

3. Express $x^2 - 4x - 9$ in the form $(x - a)^2 - b$

....

(2)

4. Express $x^2 + 6x + 25$ in the form $(x + a)^2 + b$

....

(2)

5. Roz has been asked to write $x^2 + 10x + 7$ in the form $(x + a)^2 - b$

Here is her working out.

$$x^2 + 10x + 7$$
$$(x + 10)^2 - 100 + 7$$
$$(x + 10)^2 - 93$$

Is Roz correct?
Explain your answer.

....

....

(2)

6. Write $x^2 - 3x + 7$ in the form $(x + a)^2 + b$

....

(3)

7. Georgina rewrites the expression $x^2 + px + q$ by completing the square.
She correctly obtains $(x - 5)^2 + 31$

Work out the values of p and q.

p = ... and q = ...

(3)

8. $x^2 - 4x + b \equiv (x + a)^2 + 11$

Work out the values of a and b

$a =$ .... $b =$ ....

(3)

9. $x^2 + 5ax + b \equiv (x + 20)^2 - 3a$

Work out the values of a and b

$a = $ …………………….. $b = $ …………………….....

(3)

10. $x^2 - 6x - 3 \equiv (x - a)^2 - b$, where a and b are constants

(a) Find the values of a and b.

a = …………... and b = ……………

(3)

(b) Hence solve $x^2 - 6x - 3 = 0$

x = …………..……   or   x = …………..……

(3)

11. Using completing the square, solve $x^2 - 6x + 2 = 0$

....

(5)

---

12. Using completing the square, solve $x^2 + 4x + 1 = 0$

Give your answers in surd form.

....

(5)

13. Using completing the square, solve $x^2 - 14x - 2 = 0$

Give your answers in surd form.

....

(5)

14. Express $3x^2 + 18x - 1$ in the form $a(x + b)^2 + c$

....

(3)

15. Write $3x^2 - 12x + 4$ in the form $a(x + b)^2 + c$, where a, b and c are constants

....

(4)

16. Use completing the square to find the minimum point of the curve
$y = x^2 - 6x + 1$

....

(4)

17. Use completing the square to find the minimum point of the curve
$y = x^2 + 4x + 7$

....
(4)

---

18. A curve has equation $y = x^2 - 10x + 20$

(a) Write $x^2 - 10x + 20$ in the form $(x - a)^2 - b$

....
(3)

(b) Write down the equation of the line of symmetry of $y = x^2 - 10x + 20$

....
(1)

19. (a) Write $x^2 + 8x - 7$ in the form $(x + a)^2 - b$

....
(2)

(b) Solve the equation $x^2 + 8x - 7 = 0$
     Give your answers in surd form.

x = ……………………… and x = …………………………
(3)

(c) Sketch the graph of $y = x^2 + 8x - 7$

Show the coordinates of the turning point and the coordinates of any intercepts with the coordinate axes.

(4)

20. The nth term of a sequence is $n^2 - 6n + 13$

By using completing the square, show that every term is positive.

(3)