

Factorising/Expanding/Solving Polynomials (H)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

Name:	
Total Marks:	

1. Factorise the following expressions.

a) $6x^2 + 8x$

[2]

b) $x^2 - 100$

[1]

2. Express $x^2 + 12x + 14$ in the form $(x + a)^2 + b$, where a and b are whole numbers to be found.

[2]

3. Expand and simplify $(m + 7)(m + 3)$

[2]

4. Factorise fully $20x^2 - 5$

[2]

5. Circle the equation with roots 4 and -8

$$4x(x - 8) = 0 \quad (x - 4)(x + 8) = 0$$

$$x^2 - 32 = 0 \quad (x + 4)(x - 8) = 0$$

[1]

6. Factorise $y^2 + 7y + 6$

[2]

7. $2x^2 - 6x + 5$ can be written in the form $a(x - b)^2 + c$

where a , b and c are positive numbers.

(a) Work out the values of a , b and c .

$a =$ _____
 $b =$ _____
 $c =$ _____
 [3]

(b) Using your answer to part (a), or otherwise, solve $2x^2 - 6x + 5 = 8.5$

[3]

8. (a) Find the interval for which $x^2 - 7x + 10 \leq 0$

(a) $\leq x \leq$ [3]

(b) The point $(-3, -4)$ is the turning point of the graph of $y = x^2 + ax + b$, where a and b are integers.

Find the values of a and b .

(b) $a =$ $b =$ [3]

6. $y = 6x^4 + 7x^2$ and $x = \sqrt{w + 1}$.

Find the value of w when $y = 10$.

Show your working.

[6]

7. Factorise $3x^2 + 14x + 8$

[2]

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

a) [3]

b) Write down the coordinates of the turning point of the graph of $y = x^2 + 10x + 29$.

b) (..... ,) [1]

12. a) Expand and simplify.

$$(x + 7)(x + 2)$$

a) [2]

b) Factorise completely.

$$2x^2 - 6xy$$

b) [2]

c) Solve.

$$x^2 + 5x = 24$$

c) [3]

13. Factorise $x^2 + 3x - 4$

[2]

14. Factorise $y^2 + 27y$

..... [1]

15. Expand and simplify $(y + 5)(y - 4)$

[2]

16. $x(x + 4) \equiv x^2 + 4x$

For how many values of x is $x(x + 4)$ equal to $x^2 + 4x$?

Circle your answer.

[1]

0 1 2 all

17. Factorise fully $9a^2 - 6a$

[2]

18. Write $x^2 + 2x - 8$ in the form $(x + m)^2 + n$

where m and n are integers.

[2]

19. a) Write $2x^2 + 16x + 35$ in the form $a(x + b)^2 + c$ where a , b , and c are integers.

..... [3]

b) Hence, or otherwise, write down the coordinates of the turning point of the graph of $y = 2x^2 + 16x + 35$

[1]

20. Solve $x^2 - 6x - 8 = 0$

Write your answer in the form $a \pm \sqrt{b}$ where a and b are integers.

..... [3]

21. Show that

$$(3x - 1)(x + 5)(4x - 3) = 12x^3 + 47x^2 - 62x + 15$$

for all values of x .

[3]

22. Expand and simplify $(2x + 5)(2x - 5)(3x + 7)$

[3]

23. Expand and simplify $(2x + 5y)(3x - 8y)$

[3]

24. $2x^2 - 20x + c \equiv a(x - b)^2 + 3b$

Work out the value of c .

[3]

25. $(3x + 1)(x - 2) + ax + b \equiv 3x^2 + 8x - 5$

Work out the values of a and b .

[4]

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

[2]

