

EXPANDING AND FACTORIZING

Pearson Edexcel - Monday 6 November 2017 - Paper 2 (Calculator) Higher Tier

1.

16 Solve $(x - 2)^2 = 3$

Give your solutions correct to 3 significant figures.

(Total for Question 16 is 2 marks)

Pearson Edexcel - Specimen Papers Set 1 - Paper 3 (Calculator) Higher Tier

2.

6 Factorise $x^2 + 3x - 4$

(Total for Question 6 is 2 marks)

Pearson Edexcel - Sample Paper 1 - (Non-Calculator) Higher Tier

3.

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

(Total for Question 2 is 2 marks)

Pearson Edexcel - Sample Paper 1 - (Non-Calculator) Higher Tier

4.

16 Factorise fully $20x^2 - 5$

(Total for Question 16 is 2 marks)

Pearson Edexcel - Thursday 9 June 2016 - Paper 2 (Calculator) Higher Tier

5.

2 (a) Simplify $3a \times 5b \times 2c$

.....
(1)

(b) Factorise $3y + 6$

.....
(1)

(c) Expand $x(x - 3)$

.....
(1)

(Total for Question 2 is 3 marks)

Pearson Edexcel - Wednesday 4 November 2015 - Paper 1 (Non-Calculator) Higher Tier

6.

10 (a) Expand $x(x + 2)$

(1)

(b) Expand and simplify $3(y + 2) + 4(x - 1)$

(2)

(c) Expand and simplify $(2t - 3)(t + 5)$

(2)

(d) Factorise fully $8a^2 + 12a$

(2)

(e) Factorise $y^2 - y - 2$

(2)

(Total for Question 10 is 9 marks)

Pearson Edexcel - Monday 8 June 2015 - Paper 2 (Calculator) Higher Tier

7.

7 (a) Expand $7(x + 5)$

.....
(1)

(b) Expand $3y(4y - 3)$

.....
(1)

(c) Expand and simplify $(r + 2)(r + 4)$

.....
(2)

(Total for Question 7 is 4 marks)

Pearson Edexcel - Wednesday 5 November 2014 - Paper 1 (Non-Calculator) Higher Tier

8.

12 (a) Factorise $3e^2 + 5e$

.....
(1)

(b) Solve $7(k - 3) = 3k - 5$

$k =$
(3)

(c) Expand and simplify $(2x + 3)(x - 8)$

.....
(2)

(d) Solve $\frac{7 - 3f}{4} = 2$

$f =$
(3)

(Total for Question 12 is 9 marks)

Pearson Edexcel - Monday 9 June 2014 - Paper 1 (Non-Calculator) Higher Tier

9.

6 (a) Expand $2m(m + 3)$

.....
(1)

(b) Factorise fully $3xy^2 - 6xy$

.....
(2)

.....
(Total for Question 6 is 3 marks)

Pearson Edexcel - Monday 9 June 2014 - Paper 1 (Non-Calculator) Higher Tier

10.

22 (a) Simplify $(3x^2y^4)^3$

.....
(2)

(b) Simplify $\frac{x^2 - 9}{2x^2 + 5x - 3}$

.....
(3)

.....
(Total for Question 22 is 5 marks)

Pearson Edexcel - Wednesday 6 November 2013 - Paper 1 (Non-Calculator) Higher Tier

11.

4 (a) Simplify $4y + 2x - 3 + 3x + 8$

(2)

(b) Factorise fully $9x^2 - 6xy$

(2)

(c) Expand $4(x + 2)$

(1)

(d) Expand and simplify $(x - 5)(x + 3)$

(2)

(Total for Question 4 is 7 marks)

Pearson Edexcel - Tuesday 11 June 2013 - Paper 1 (Non-Calculator) Higher Tier

12.

4 (a) Expand $3(2 + t)$

.....
(1)

(b) Expand $3x(2x + 5)$

.....
(2)

(c) Expand and simplify $(m + 3)(m + 10)$

.....
(2)

(Total for Question 4 is 5 marks)

Pearson Edexcel - Friday 14 June 2013 - Paper 2 (Calculator) Higher Tier

13.

19 (a) Factorise $6 + 9x$

.....
(1)

(b) Factorise $y^2 - 16$

.....
(1)

(c) Factorise $2p^2 - p - 10$

.....
(2)

(Total for Question 19 is 4 marks)

Pearson Edexcel - Thursday 28 February 2013 - Paper 1 (Non-Calculator) Higher Tier

14.

20 (a) (i) Factorise $x^2 - 12x + 27$

(ii) Solve the equation $x^2 - 12x + 27 = 0$

(3)

(b) Factorise $y^2 - 100$

(1)

(Total for Question 20 is 4 marks)

Pearson Edexcel - Monday 4 March 2013 - Paper 2 (Calculator) Higher Tier

15.

11 (a) Expand and simplify $3(x + 4) + 2(5x - 1)$

(2)

(b) Expand and simplify $(2x + 1)(x - 4)$

(2)

(c) Factorise completely $6y^2 - 9xy$

(2)

(Total for Question 11 is 6 marks)

Pearson Edexcel - Tuesday 6 November 2012 - Paper 1 (Non-Calculator) Higher Tier

16.

11 (a) Expand $4(3x + 5)$

(1)

(b) Expand and simplify $2(x - 4) + 3(x + 5)$

(2)

(c) Expand and simplify $(x + 4)(x + 6)$

(2)

(Total for Question 11 is 5 marks)

Pearson Edexcel - Thursday 8 November 2012 - Paper 2 (Calculator) Higher Tier

17.

14 (a) Factorise $x^2 + 7x$

(1)

(b) Factorise $y^2 - 10y + 16$

(2)

*(c) (i) Factorise $2t^2 + 5t + 2$

(ii) t is a positive whole number.

The expression $2t^2 + 5t + 2$ can never have a value that is a prime number.

Explain why.

(3)

(Total for Question 14 is 6 marks)

Pearson Edexcel - Monday 11 June 2012 - Paper 1 (Non-Calculator) Higher Tier

18.

16 (a) Simplify $(m^{-2})^5$

(1)

(b) Factorise $x^2 + 3x - 10$

(2)

(Total for Question 16 is 3 marks)

Pearson Edexcel - Monday 11 June 2012 - Paper 1 (Non-Calculator) Higher Tier

19.

23 (a) Simplify fully $\frac{x^2 + 3x - 4}{2x^2 - 5x + 3}$

.....
(3)

(b) Write $\frac{4}{x+2} + \frac{3}{x-2}$ as a single fraction in its simplest form.

.....
(3)

.....
(Total for Question 23 is 6 marks)
.....

Pearson Edexcel - Wednesday 13 June 2012 - Paper 2 (Calculator) Higher Tier

20.

14 (a) Expand and simplify $(p + 9)(p - 4)$

.....
(2)

(b) Solve $\frac{5w - 8}{3} = 4w + 2$

$w =$
(3)

(c) Factorise $x^2 - 49$

.....
(1)

(d) Simplify $(9x^4y^3)^{\frac{1}{2}}$

.....
(2)

.....
(Total for Question 14 is 8 marks)

Pearson Edexcel - Friday 2 March 2012 - Paper 3 (Non-Calculator) Higher Tier

21.

15. (a) Factorise fully $2x^2 - 4xy$

.....
(2)

(b) Factorise $p^2 - 6p + 8$

.....
(2)

(c) Simplify $\frac{(x+2)^2}{x+2}$

.....
(1)

(d) Simplify $2a^2b \times 3a^3b$

.....
(2)

(Total 7 marks)

Pearson Edexcel - Monday 5 March 2012 - Paper 4 (Calculator) Higher Tier

22.

8. (a) Simplify $x^5 \times x^4$

.....
(1)

(b) Simplify $y^7 + y^2$

.....
(1)

(c) Expand and simplify $3(2a + 5) + 5(a - 2)$

.....
(2)

(d) Expand and simplify $(y + 5)(y + 7)$

.....
(2)

(e) Factorise $p^2 - 6p + 8$

.....
(2)

.....
(Total 8 marks)

7. (a) Solve $3(2t - 4) = 2t + 12$

$t = \dots\dots\dots$
(3)

(b) Expand and simplify $2(x - y) - 3(x - 2y)$

$\dots\dots\dots$
(2)

(c) Expand and simplify $(x - 5)(x + 7)$

$\dots\dots\dots$
(2)

(Total 7 marks)

Pearson Edexcel - Monday 14 November 2011 - Paper 4 (Calculator) Higher Tier

24.

14. (a) Factorise $6x + 4$

$\dots\dots\dots$
(1)

(b) Factorise fully $9x^2y - 15xy$

$\dots\dots\dots$
(2)

(Total 3 marks)

Pearson Edexcel - Monday 14 November 2011 - Paper 4 (Calculator) Higher Tier

25.

23. (a) Factorise $x^2 + px + qx + pq$

.....
(2)

(b) Factorise $m^2 - 4$

.....
(1)

(c) Write as a single fraction in its simplest form $\frac{2}{x-4} - \frac{1}{x+3}$

.....
(3)

.....
(Total 6 marks)

Pearson Edexcel - Monday 6 June 2011 - Paper 3 (Non-Calculator) Higher Tier

26.

15. (a) Expand $x(x + 2)$

.....
(2)

(b) Expand and simplify $(x + 3)(x - 4)$

.....
(2)

(c) Factorise completely $2y^2 - 4y$

.....
(2)

(d) Factorise $x^2 - 9$

.....
(1)

(Total 7 marks)

Pearson Edexcel - Tuesday 9 November 2010 - Paper 3 (Non-Calculator) Higher Tier

27.

16. (a) Expand and simplify $3(x + 5) + 2(5x - 6)$

.....
(2)

(b) Simplify $\frac{2x + 4}{2}$

.....
(1)

(c) Factorise $5x + 10$

.....
(1)

(d) Factorise fully $x^2y + xy^2$

.....
(2)

(Total 6 marks)

17. (a) Factorise $3x + 12$

.....
(1)

(b) Solve $4(2x - 3) = 5x + 7$

$x =$
(3)

(c) Expand and simplify $(y + 4)(y + 5)$

.....
(2)

(d) Factorise fully $8x^2 + 12xy$

.....
(2)

(Total 8 marks)

Pearson Edexcel - Friday 11 June 2010 - Paper 4 (Calculator) Higher Tier

29.

19. (a) Factorise $x^2 - 7x + 10$

.....
(2)

(b) Solve $x^2 - 7x + 10 = 0$

$x =$
or $x =$
(1)

(Total 3 marks)

Pearson Edexcel - Thursday 5 November 2009 - Paper 3 (Non-Calculator) Higher Tier

30.

10. (a) Simplify $3a + 4c - a + 3c$

.....
(2)

(b) Expand $y(2y - 3)$

.....
(1)

(c) Factorise $x^2 - 4x$

.....
(2)

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

.....
(2)

(e) Solve $3(x + 2) = 8$

$x =$
(2)

.....
(Total 9 marks)

OCR GCSE – Tuesday 3 November 2020 – Paper 4 (Calculator) Higher Tier

31.

17 Expand and simplify.

$$(x + 1)(x - 1)(x + 2)$$

..... [3]

OCR GCSE – Tuesday 5 November 2019 – Paper 4 (Calculator) Higher Tier

32.

16 Show that $\frac{x+9}{x^2-1} + \frac{4}{x+1}$ can be written in the form $\frac{a}{x-1}$, where a is an integer. [4]

OCR GCSE – Thursday 7 November 2019 – Paper 5 (Non-Calculator) Higher Tier

33.

6 Solve by factorising.

$$x^2 + 9x + 20 = 0$$

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

OCR GCSE – Tuesday 21 May 2019 – Paper 4 (Calculator) Higher Tier

34.

17 Show that $(a^3)^{-\frac{1}{3}} \times (a^2)^{\frac{1}{2}} = 1$.

[3]

OCR GCSE – Tuesday 11 June 2019 – Paper 6 (Calculator) Higher Tier

35.

15 Solve by factorisation.

$$5x^2 + 7x + 2 = 0$$

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

OCR GSCE – Tuesday 6 November 2018 – Paper 4 (Calculator) Higher Tier

36.

13 Tenzin is given this question.

Factorise fully.

$$2x^2 + 6x$$

Here is his answer.

$$2x^2 + 6x = x(2x + 6)$$

Explain why Tenzin's answer is not correct.

.....
..... [1]

OCR GSCE – Monday 12 November 2018 – Paper 6 (Calculator) Higher Tier

37.

21 Show that $\frac{5x}{x+5} + \frac{25}{x-7} - \frac{300}{(x+5)(x-7)}$ simplifies to an integer. [6]

38.

16 Solve by factorisation.

$$3x^2 + 11x - 20 = 0$$

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

OCR GCSE – Thursday 7 June 2018 – Paper 5 (Non - Calculator) Higher Tier

39.

17 $(x + a)(x + 3)(2x + 1) = bx^3 + cx^2 + dx - 12$

Find the value of a , b , c and d .

$a =$

$b =$

$c =$

$d =$ [4]

OCR GSCE – Tuesday 12 June 2018 – Paper 6 (Calculator) Higher Tier

40.

19 Show that $\frac{2x^2 + 13x + 20}{2x^2 + x - 10}$ simplifies to $\frac{x + a}{x - b}$ where a and b are integers. [4]

OCR GSCE – Tuesday 2 November 2017 – Paper 4 (Calculator) Higher Tier

41.

15 Show that $\frac{4 + 2\sqrt{5}}{\sqrt{5} - 1}$ can be simplified to $\frac{3\sqrt{5} + 7}{2}$. [4]

OCR GSCE – Thursday 25 May 2017 – Paper 4 (Calculator) Higher Tier

42.

16 Write $x^2 - 10x + 16$ in the form $(x + a)^2 + b$.

..... [3]

43.

17 (a) Simplify.

$$\frac{x^2 - 16}{x^2 - 3x - 4}$$

(a) [4]

(b) $(x + 3)(x - 4)(x + 5)$ is identical to $x^3 + ax^2 - 17x + b$.

Find the value of a and the value of b .

(b) $a =$

$b =$ [2]

AQA GCSE – Tuesday 19 May 2020 – Paper 1 (Non - Calculator) Higher Tier

44.

28

Factorise fully $144 - 4x^2$

[2 marks]

Answer _____

AQA GCSE – Thursday 4 June 2020 – Paper 2 (Calculator) Higher Tier

45.

19

a and b are positive values.

Show that $\frac{7a + 2b - 3a}{8a + 6b + 2a - b}$ always simplifies to the same value.

[3 marks]

AQA GCSE – Thursday 4 June 2020 – Paper 2 (Calculator) Higher Tier

46.

25 Factorise $3x^2 + 11x - 20$

[2 marks]

Answer _____

AQA GCSE – Thursday 8 June 2020 – Paper 3 (Calculator) Higher Tier

47.

10 Expand and simplify fully $4(2c + 3) - (5c - 1)$

[2 marks]

Answer _____

AQA GCSE – Tuesday 21 May 2019 – Paper 1 (Non - Calculator) Higher Tier

48.

18 Here is an identity.

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

18 (a) Use the identity to work out the value of $193^2 - 7^2$
You **must** show your working.

[2 marks]

Answer _____

18 (b) Factorise $100a^2 - 81b^2$

[1 mark]

Answer _____

49.

26 $(x + 5)(x + 2)(x + a) = x^3 + bx^2 + cx - 30$

Work out the values of the integers a , b and c .

[3 marks]

$a =$ _____

$b =$ _____

$c =$ _____

50.

27 (a) Jo wants to work out the solutions of $x^2 + 3x - 5 = 0$

She says,

“The solutions **cannot** be worked out because

$x^2 + 3x - 5$ does **not** factorise to $(x + a)(x + b)$ where a and b are integers.”

Is Jo correct?

Tick a box.

Yes

No

Give a reason for your answer.

[1 mark]

27 (b) **Without** expanding any brackets,

show how to work out the **exact** solutions of $9(x + 3)^2 = 4$

Give the solutions.

[3 marks]

AQA GCSE – Monday 24 May 2018 – Paper 1 (Non - Calculator) Higher Tier

51.

28 Simplify $\sqrt{80} + \sqrt{2\frac{2}{9}}$

Give your answer in the form $\frac{a\sqrt{5}}{b}$ where a and b are integers.

[3 marks]

Answer _____

AQA GCSE – Thursday 6 November 2017 – Paper 2 (Calculator) Higher Tier

52.

16 (a) Factorise fully $9y^3 - 6y$

[2 marks]

Answer _____

16 (b) Factorise $3x^2 - 22x + 7$

[2 marks]

Answer _____

AQA GCSE – Wednesday 8 November 2017 – Paper 3 (Calculator) Higher Tier

53.

18 Expand and simplify $(3x^2 + 2)(2x + 5) - 6x(x^2 - 3)$

[4 marks]

Answer _____

AQA GSCE – Wednesday 25 May 2017 – Paper 1 (Non - Calculator) Higher Tier

54.

26 Expand and simplify $(x - 4)(2x + 3y)^2$

[4 marks]

Answer _____

AQA GSCE – Sample Paper 3 (Calculator) Higher Tier

55.

17 Factorise $3x^2 + 14x + 8$

[2 marks]

Answer _____