



EXAM PAPERS PRACTICE

GCSE OCR Math J560

Factorising Quadratics

Answers

*"We will help you to
achieve A Star "*



Answer 1

Factorise $y^2 - 10y + 16$

$\rightarrow +ve$ so signs will be the same
 $\rightarrow -ve$ so both -ve

$$= \underline{\underline{(y-2)(y-8)}}$$

+16
-1x-16
-2x-8

Answer 2

(b) Factorise $y^2 - 100$

DOTS.

$$a^2 - b^2$$
$$= (a+b)(a-b)$$

$a = y$ $b = -10$

$$y^2 - 10^2 = \underline{\underline{(y+10)(y-10)}}$$



Answer 3

Factorise $n^2 - 7n$

$$\begin{aligned}n^2 - 7n &= n \times n - 7 \times n \\ &= \underline{n(n-7)}\end{aligned}$$

Answer 4

Factorise $x^2 + 3x - 4$

$$= \underline{(x+4)(x-1)}$$

$$\begin{array}{r} -4 \\ \hline 1x - 4 \\ 2x - 2 \\ \hline 4x - 1 \end{array}$$



Answer 5

Factorise $x^2 + 3x - 10$

$$x^2 + 3x - 10 = (x + 5)(x - 2)$$

SIGNS IN BRACKETS ARE DIFFERENT

→ LARGER NUMBER IS POSITIVE

$$\begin{array}{r} -10 \\ \hline -1 \times 10 \\ -2 \times 5 \end{array}$$

SEE TUTORIAL ON FACTORISING QUADRATICS FOR MORE HELP!



Answer 6

Factorise $y^2 - 16$

$$\triangle = y^2 - 4^2 = \underline{(y+4)(y-4)}$$

DOTS

$$a^2 - b^2 = (a+b)(a-b)$$

Answer 7

Factorise $4x^2 - 9$

$$(2x)^2 - 3^2 \\ = \underline{(2x+3)(2x-3)}$$

DIFFERENCE OF TWO SQUARES

$$a^2 - b^2 = (a+b)(a-b)$$



Answer 8

Factorise $y^2 - y - 2$

SIGNS ARE DIFFERENT
BIGGER NUMBER WILL BE -VE

$$y^2 - y - 2 = \underline{(y+1)(y-2)}$$

Answer 9

(a) Factorise $a^2 - b^2$

$$a^2 - b^2 = \underline{\underline{(a-b)(a+b)}}$$

DIFFERENCE OF TWO SQUARES
$a^2 - b^2 = (a-b)(a+b)$

Answer 10

Factorise $x^2 - 49$

$$\begin{aligned} &= x^2 - 7^2 \\ &= \underline{\underline{(x+7)(x-7)}} \end{aligned}$$

DOTS
$(a+b)(a-b) = a^2 - b^2$



Answer 11

Factorise fully $20x^2 - 5$

$$\begin{aligned} & 20x^2 - 5 \\ &= 4 \times 5 \times x \times x - 5 \times 1 \\ &= 5(4x^2 - 1) \\ &\quad \begin{array}{c} \downarrow \qquad \qquad \downarrow \\ (2x)^2 - 1^2 \\ \downarrow \qquad \qquad \downarrow \\ a^2 - b^2 \end{array} \\ &= \underline{\underline{5(2x-1)(2x+1)}} \end{aligned}$$

DIFFERENCE OF TWO SQUARES
$a^2 - b^2 = (a-b)(a+b)$

Answer 12

Factorise fully $4(x-5)^2 + 3(x-5)$

Take out a factor of $x-5$

$$\begin{aligned} & (x-5)(4(x-5)+3) \\ & (x-5)(4x-20+3) \\ & (x-5)(4x-17) \end{aligned}$$

$$\underline{\underline{(x-5)(4x-17)}}$$



Answer 13

(b) By finding suitable values of a and c , use part (a) to write 650065 as the sum of two square numbers.

$$650065 = 65 \times 10001$$

$$\text{If } a = 8 \text{ and } c = 100$$

$$ac - 1 = 800 - 1$$

$$a+c = 108$$

$$\text{Sum of } 108^2 + 800^2$$

$$650065 = \dots\dots\dots 108^2 \dots\dots\dots + \dots\dots\dots 799^2 \dots\dots\dots$$

Answer 14

Solve $x^2 = 4(x-3)^2$

$$x^2 = 4(x^2 - 6x + 9)$$

$$x^2 = 4x^2 - 24x + 36$$

$$-x^2 \quad -2x^2$$

$$0 = \frac{3x^2}{3} - \frac{24x}{3} + \frac{36}{3}$$

$$0 = x^2 - 8x + 12$$

$$0 = (x-2)(x-6)$$

*Signs same
Both -ve*

$$x-2=0 \quad \text{or} \quad x-6=0$$

$$\underline{x=2} \quad \underline{x=6}$$

$$(x-3)^2$$

$$(x-3)(x-3)$$

$$= x^2 - 3x - 3x + 9$$

$$= x^2 - 6x + 9$$

$$\begin{array}{r} +12 \\ -1x-12 \\ -2x-6 \end{array}$$



Answer 15

Factorise completely $(12x - y)^2 - (4x - 3y)^2$

$$(12x - y)(12x - y) - (4x - 3y)(4x - 3y)$$

Expand using foil

$$(144x^2 - 12xy - 12xy + y^2) - (16x^2 - 12xy - 12xy + 9y^2)$$

$$144x^2 - \cancel{12xy} - \cancel{12xy} + y^2 - 16x^2 + 12xy + 12xy - 9y^2$$

$$144x^2 - 16x^2 + y^2 - 9y^2$$

$$128x^2 - 8y^2$$

$$8(16x^2 - y^2)$$

Difference of two squares $\rightarrow 8(4x - y)(4x + y)$

$8(4x - y)(4x + y)$