

Factorising Solutions

Factorising

Factorising 1

1. $5(x - 6)$

2. $3(3x + 2)$

3. $x(x + 6)$

4. $6y(y^2 - 2)$

5. $7a(ab + 3b - 2)$

6. $12(x^2 + xy + y^2)$

7. $(t - 1)(3t + 7)$

8. $(x^2 + 3)(2x - 5)$

Fractions 2

1. $7(x + 4)$

2. $7(2 - 3x)$

3. $y(y - 8)$

4. $3t^2(t^2 + 3)$

5. $3xy(x^2 - 4y - 2)$

6. $2b(4a^3 + 3y^2 - 5)$

7. $(x + 3)(6x + 5)$

8. $(3 - 2y)(7y - 2)$

Enough Information

$$ab + bc = 245 + 635 \rightarrow b(a + c) = 880 \text{ so } b = 10$$

Square Root

$$63$$

The Root Cause

$$3y(x + 3)$$

Power Puzzle

$$2\sqrt{x}$$

Factor Problem

Choosing 3, 5 and 8 gives

$$3(5x + 8) = 15x + 24$$

$$3(8x + 5) = 24x + 15$$

$$5(3x + 8) = 15x + 40$$

$$5(8x + 3) = 40x + 15$$

$$8(3x + 5) = 24x + 40$$

$$8(5x + 3) = 40x + 24$$

$$\text{Total is: } 158x + 158 \text{ or } 158(x + 1)$$

So $x + 1$ is factor for every final expression

Further Factorising

Further Factorising 1

1. $(x + 6)(x - 1)$

2. $(x + 15)(x - 2)$

3. $(y - 10)(y - 3)$

4. $(t + 5)(t - 3)$

5. $(k - 6)(k + 4)$

6. $(p - 7)(p - 3)$

7. $x(x - 16)$

8. $(2x - 1)(3x - 4)$

Factorising Solutions

Further Factorising 2

1. $(x + 7)(x - 1)$
2. $(y + 4)(y - 3)$
3. $(y - 7)(y - 4)$
4. $(t + 9)(t - 2)$
5. $(k + 5)(k + 4)$
6. $(x + 8)(x - 7)$
7. $p(p - 25)$
8. $(3x - 4)(x^2 - 1)$

Difference of Two Squares

1. $(x - 6)(x + 6)$
2. $(y + 12)(y - 12)$
3. $(x + y)(x - y)$
4. $(2t - 9)(2t + 9)$
5. $(x + \sqrt{5})(x - \sqrt{5})$

Trickier Quadratics

1. $(3x + 2)(x - 4)$
2. $(2x - 3)(x - 2)$
3. $(2y + 1)(2y + 9)$
4. $(3x - 8)(2x + 1)$
5. $(5x + 4)(4x - 3)$

Further Factorising Problems

1. $2(t - 4)(t + 4)$
2. $x(x - 3)(x - 4)$
3. $(x^2 - 2)(x^2 + 1)$
4. $(y^2 + 25)(y - 5)(y + 5)$

Without a calculator 80, 9800, 998 000

Still without a calculator 0

Top and Bottom $\frac{x-5}{x+5}$

Completing the Square

Completing the square 1

1. $(x + 2)^2 - 4$
2. $(x + 2)^2 + 1$
3. $(y - 4)^2 - 16$
4. $(y - 4)^2 - 9$
5. $(x - 6)^2 + 5$
6. $(k + 5)^2 - 27$
7. $\left(y + \frac{3}{2}\right)^2 - \frac{5}{4}$
8. $(p - 1)^2$

Factorising Solutions

Completing the square 2

1. $(x + 5)^2 - 25$ 2. $(x + 5)^2 + 5$ 3. $(y - 1)^2 - 1$ 4. $(y - 1)^2 + 2$
5. $(x - 4)^2 + 9$ 6. $(k + 7)^2 - 50$ 7. $\left(y + \frac{5}{2}\right)^2 - \frac{1}{4}$ 8. $(t + 3)^2$

Different Forms Solution

Each **column** is the same quadratic but in different forms

$a^2 + 6a + 8$	$(a - 4)^2 - 1$	$(a - 4)(a + 2)$	$a^2 + 2a - 15$
$(a + 2)(a + 4)$	$(a - 3)(a - 5)$	$a^2 - 2a - 8$	$(a + 1)^2 - 16$
$(a + 3)^2 - 1$	$a^2 - 8a + 15$	$(a - 1)^2 - 9$	$(a + 5)(a - 3)$

Extra Puzzles $\frac{2+2+2}{2} = 3$

One possible solution.....

$$a^2 - b^2 = (65 + 35)(65 - 35)$$

$$c^2 - d^2 = (70 + 30)(70 - 30)$$

$$e^2 - f^2 = (550 + 450)(550 - 450)$$