# Worksheet: Factoring Quadratics When the Leading Coefficient Is 1

**Q1:** Factorise fully $x^2 - x - 30$.

Question Video

A $(x - 5)(x - 6)$

B $(x - 5)(x + 6)$

C $(x + 5)(x - 6)$

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

**Q2:** Factorise fully $x^2 + 3x + 2$.

Question Video

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

B $(x - 2)(x - 1)$

C $(x + 2)(x + 1)$

D $(x + 1)(x + 3)$

**Q3:** Factorise fully $x^2 - 5x + 6$.

Question Video

A $(x + 3)(x - 2)$

B $(x + 3)(x + 2)$

C $(x - 3)(x - 2)$

D $(x - 6)(x - 1)$

**Q4:** Factorise fully $x^2 + 2x - 35$.

Question Video

A $(x + 5)(x + 7)$

B $(x + 5)(x - 7)$

C $(x - 5)(x + 7)$

D $(x + 1)(x - 35)$

**Q5:** Factorise fully $x^2 - 5x - 24$.

Question Video

A $(x + 8)(x + 3)$

B $(x + 8)(x - 3)$

C $(x - 8)(x + 3)$

D $(x + 6)(x - 4)$

**Q6:** Factorise fully $x^2 - 9x + 18$.

Question Video

A $(x + 3)(x - 6)$

B $(x + 3)(x + 6)$

C $(x - 3)(x - 6)$

D $(x - 18)(x - 1)$

**Q7:** Factorise fully $x^2 - 13x + 40$.

Question Video

A $(x + 5)(x - 8)$

B $(x + 5)(x + 8)$

C $(x - 5)(x - 8)$

D $(x - 10)(x - 4)$

**Q8:** Factorise fully $x^2 + 8x - 9$.

Question Video

A $(x + 1)(x + 9)$

B $(x + 1)(x - 9)$

C $(x - 1)(x + 9)$

D $(x - 3)(x + 3)$

**Q9:** Factorise fully $x^2 + 5x - 36$.

Question Video

A $(x + 4)(x + 9)$

B $(x + 4)(x - 9)$

C $(x - 4)(x + 9)$

D $(x + 18)(x - 2)$

**Q10:** Factorise fully $x^2 + 3x - 4$.

Question Video

A $(x - 4)(x - 1)$

B $(x - 4)(x + 1)$

C $(x + 4)(x - 1)$

D $(x - 2)(x + 2)$

**Q11:** Factorise fully $x^2 - 15xy + 54y^2$.

Question Video

A $(x - 9y)(x - 6y)$

B $(x + 9y)(x - 6y)$

C $(x + 9y)(x + 6y)$

D $(x - 18y)(x - 3y)$

**Q12:** Factorise fully $x^2 - 9xy + 20y^2$.

Question Video

A $(x - 4y)(x - 5y)$

B $(x + 4y)(x - 5y)$

C $(x + 4y)(x + 5y)$

D $(x - 10y)(x - 2y)$

**Q13:** Factorise fully $x^2 - 8xy - 9y^2$.

Question Video

A $(x + y)(x - 9y)$

B $(x - y)(x - 9y)$

C $(x - y)(x + 9y)$

D $(x + 3y)(x - 3y)$

**Q14:** Factorise fully $5y^4 + 40z^2 + 30y^2z$.

Question Video

A $(5y^2 + z)(y^2 + 8z)$

B $5(y^2 - 2z)(y^2 - 4z)$

C $5(y^2 + 2z)(y^2 - 4z)$

D $5(y^2 + 2z)(y^2 + 4z)$

E $(5y^2 - 2z)(y^2 + 4z)$

**Q15:** Which of the following is equivalent to $(x - 3y)(x + 3y)(x^4 - 18x^2y^2 + 81y^4)$?

A $\left(x^2 - 9y^2\right)\left(x^2 + 9y^2\right)$

B $x^6 - 27y^6$

C $\left(x^3 - 27y^3\right)\left(x^3 + 27y^3\right)$

D $(x - 3y)^3(x + 3y)^3$

E $\left(x^2 - 9y^2\right)$

**Q16:** Factorise fully $\left(a^2 + 12ab + 36b^2\right) - 36c^2$.

A $(a + 6b + 6c)(a + 6b - 6c)$

B $\left(a + 6b + 6c^2\right)\left(a + 6b - 6c^2\right)$

C $(a - 6b + 6c)(a - 6b - 6c)$

D $(a + 6b + 6c)(a - 6b - 6c)$

E $(a + 144b + 6c)(a + 144b - 6c)$

**Q17:** Find the solution set of $x(x - 19) = -15x$ in $\mathbb{R}$.

A $\{0, 4\}$

B $\{4\}$

C $\{19, -15\}$

D $\{0, -4\}$

E $\{-4\}$

**Q18:** Find the solution set of $(x + 9)^2 = (x + 9)$ in $\mathbb{R}$.

A $\{9\}$

B $\{9, -8\}$

C $\{-9, -8\}$

D $\{10\}$

E $\{-9, -10\}$

**Q19:** What property is illustrated by the step

$$x^2 + x - 12 = 0,$$
$$x^2 + 4x - 3x - 12 = 0?$$

A The associative property of multiplication

B The distributive property of multiplication over addition

C The property of opposites

D The commutative property of addition

E The associative property of addition

**Q20:** Solve the equation $x^2 - 8x + 16 = 0$ by factoring.

A $x = 4$

B $x = -4$

C $x = 8$ or $x = 2$

D $x = -8$ or $x = -2$

**Q21:** Find the possible values of $x^3$ if $x^2 = \frac{1}{4}$.

A $\frac{1}{2}, -\frac{1}{2}$

B $\frac{1}{8}, -\frac{1}{8}$

C $-\frac{1}{2}$

D $\frac{1}{8}$

E $-\frac{1}{8}$

**Q22:** Solve the equation $(x-3)(x+8) = 0$.

A $x = 3, x = -8$

B $x = -3, x = 8$

C $x = -3, x = -8$

D $x = 3, x = 8$

**Q23:** Identify the solutions to the equation $(x-3)(x+8) = 0$.

A $x = -3$ or $x = 8$

B $x = 3$ or $x = 8$

C $x = -3$ or $x = -8$

D $x = 3$ or $x = -8$

**Q24:** If the function $f\colon \mathbb{N} \to \mathbb{Z}$, where $f(x) = (x + 17)^2$, and the function $g\colon \mathbb{N} \to \mathbb{Z}$, where $g(x) = x + 17$, find the solution set of $x$ which makes $f(x) = g(x)$.

A $\varnothing$

B $\{-17\}$

C $\{17, 16\}$

D $\{-16\}$

**Q25:** Given that $x + \frac{16}{x} = 8$, find $x^2 + \frac{16}{x^2}$.

A 16

B 17

C 64

D 15

E 8