

Factoring Polynomials: math test solutions, Grade 9

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Test solutions with the detailed point scale. Add up your points and spot what to review.

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Greatest common factor

/ 3 pts

GCF of 20, 15, 35 is 5 (1 pt); smallest exponents give xy , so the GCF is $5xy$ (1 pt).

$$20x^3y - 15x^2y^2 + 35xy = 5xy(4x^2 - 3xy + 7) \text{ (1 pt).}$$

2 Trinomials

/ 4 pts

a) $(x + 4)(x + 9)$ (1 pt).

b) $(x - 10)(x + 6)$ (1 pt).

c) $ac = 24$: 12 and 2. $3x(x + 4) + 2(x + 4) = (x + 4)(3x + 2)$ (1 pt).

d) $ac = 24$: -8 and -3 . $2x(x - 4) - 3(x - 4) = (x - 4)(2x - 3)$ (1 pt).

3 Grouping and patterns

/ 3 pts

a) $2x^2(x - 3) + 5(x - 3) = (x - 3)(2x^2 + 5)$ (1 pt).

b) $(9x - 4)(9x + 4)$ (1 pt).

c) $2 \cdot 6x \cdot 5 = 60x$, so $(6x + 5)^2$ (1 pt).

4 Solving equations

/ 4 pts

a) $x = \frac{1}{2}$ or $x = -8$ (1 pt).

b) $(x - 8)(x + 5) = 0$, so $x = 8$ or $x = -5$ (1 pt).

c) $5x(x - 9) = 0$, so $x = 0$ or $x = 9$ (1 pt).

d) $(3x - 8)(3x + 8) = 0$, so $x = \pm \frac{8}{3}$ (1 pt).

5 A rectangular patio

/ 3 pts

Let w be the width: $w(w + 4) = 96$ (1 pt), so $w^2 + 4w - 96 = 0$ and

$(w + 12)(w - 8) = 0$ (1 pt).

The width must be positive: $w = 8$ ft, length 12 ft. Check: $8 \cdot 12 = 96$ (1 pt).

6 Find the error

/ 3 pts

$(x - 3)(x + 3) = x^2 - 9$, which is not the given trinomial (1 pt).

The trinomial is a perfect square: $x^2 - 6x + 9 = (x - 3)^2$ (1 pt).

So $x = 3$ is the only solution; check: $9 - 18 + 9 = 0$ (1 pt).



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