

Practice Test 3: Quadratic Expressions and Equations

K: _____	A: _____	T: _____	C: _____
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PART A: Multiple Choice Questions

Instructions: Circle the English letter of the best answer.

Circle one and ONLY one answer for each question.

Knowledge/Thinking:

1. Which expression is equivalent to $(2x + 9)^2$?

- (a) $4x^2 + 81$ (b) $4x^2 - 81$ (c) $4x^2 - 36x + 81$ (d) $4x^2 + 36x + 81$ (e) $4x^2 + 18x + 81$

2. Which expression is the result of expanding and simplifying $(5x - 7)(3x + 5)$?

- (a) $15x^2 + 4x - 35$ (b) $15x^2 - 35$ (c) $15x^2 - 46x - 35$ (d) $15x^2 - 4x - 35$ (e) $8x^2 - 2$

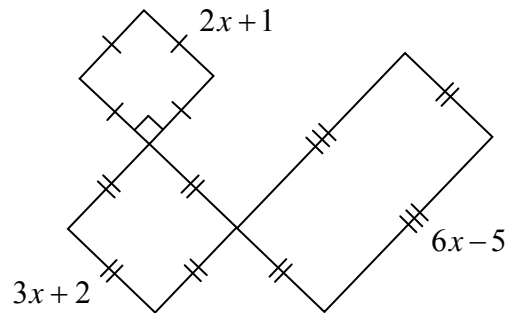
3. Which expression is the factored form of $x^2 - 8x - 20$?

- (a) $(x - 8)(x - 20)$ (b) $(x - 10)(x + 2)$ (c) $(x + 4)(x - 5)$ (d) $(x + 8)(x + 20)$ (e) $(x - 2)(x + 10)$

4. Which expression is the factored form of $4x^2 - 44x - 240$?

- (a) $4(x - 4)(x - 60)$ (b) $4(x - 15)(x + 4)$ (c) $4(x - 11)(x - 60)$ (d) $4(x + 11)(x - 60)$ (e) $4(x + 15)(x - 4)$

5. Which of the following expressions represents the area of the given figure?



- (a) $(2x + 1)(3x + 2)(6x - 5)$
 (b) $(2x + 1)^2 + (3x + 2)^2 + (6x - 5)^2$
 (c) $(2x + 1)(3x + 2) + (3x + 2)(6x - 5)$
 (d) $(2x + 1)^2 + (3x + 2)^2 + (2x + 1)(6x - 5)$
 (e) $(2x + 1)^2 + (3x + 2)^2 + (3x + 2)(6x - 5)$

Part B: Full Solution Questions**Instructions: Show all steps for full mark.****Provide answer statements in complete English sentences where applicable.****Knowledge:**

1. Expand and simplify.

(a) $(5x - 7)(4x + 3)$ [K: 3]

(b) $(2x - 3)(2x + 3)$ [K: 3]

(c) $(3x - 2)^2$ [K: 3]

(d) $(4a + 5)^2$ [K: 3]

(e) $(x - 7)(5x + 3) - (2x - 1)^2$ [K: 7]

2. Factor each polynomial.

(a) $-2.3t^2 - 34.5t$ [K: 2]

(b) $x^2 + 10x + 25$ [K: 3]

(c) $x^2 + 2x - 24$ [K: 2]

(d) $3x^2 - 12x - 135$ [K: 3]

3. Factor each polynomial.

(a) $-8x^2 + 200$ [K: 3]

(b) $3y^2 + 13y - 10$ [K: 2]

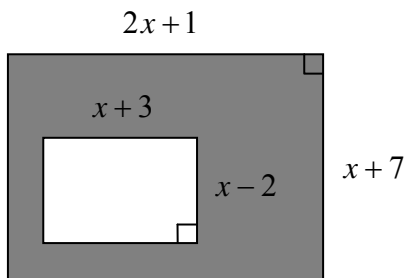
(c) $2x^2 - 24x + 72$ [K: 4]

(d) $6x^2 - 11x - 10$ [K: 2]

Communication:

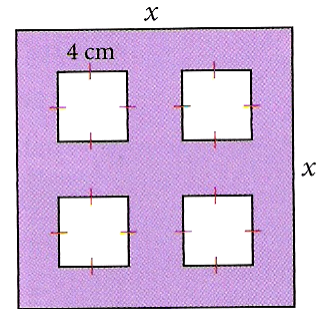
4. Describe in words the steps you follow to factor $2x^2 - 8x - 10$. [C: 4]

5. Describe in words the steps you follow to find a simplified algebraic expression for the shaded area of the following figure. [C: 3]



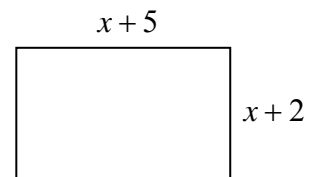
Application:

6. (a) Write a factored expression for the area of the shaded region of this figure. [A: 4]



(b) Calculate the area of the shaded region when $x = 30$ cm. [A: 2]

7. The area of the rectangle shown in the diagram is 40 cm^2 . What are its dimensions? [A: 8]



Thinking:

8. A rectangular garden with dimensions 16 m by 14 m is surrounded by a paved border of uniform width, x .

(a) Draw and label a diagram to represent the garden and the border. [T: 2]

(b) Write a simplified expression for the area of the border. [T: 6]

(c) If the area of the border is 216 m^2 , find the width of the border. [T: 4]

9. A picture that measures 10 cm by 8 cm is to be surrounded by a mat before being framed. The width of the mat is to be the same on all 4 sides of the picture. What is the width of the mat if the total area of the picture and the mat is to be 168 cm²? [T: 8]

Answers:**Part A:**

1. d; 2. a; 3. b; 4. b; 5. e

Part B:

1. (a) $20x^2 - 13x - 21$, (b) $4x^2 - 9$, (c) $9x^2 - 12x + 4$, (d) $16a^2 + 40a + 25$, (e) $x^2 - 28x - 22$;

2. (a) $-2.3t(t + 15)$, (b) $(x + 5)^2$, (c) $(x + 6)(x - 4)$, (d) $3(x - 9)(x + 5)$;

3. (a) $-8(x + 5)(x - 5)$, (b) $(3x - 2)(x + 5)$, (c) $2(x - 6)^2$, (d) $(3x + 2)(2x - 5)$;

4. First, factor out the greatest common factor, 2. Second, find the factors for the first term, x^2 . Third, use the constant term, -5 , to find two factors whose sum is -4 . Last, write the binomial factors inside the brackets as $(x + m)(x + n)$.

5. First, multiply $2x + 1$ and $x + 7$ to find the area of the big rectangle. Second, multiply $x + 3$ and $x - 2$ to find the area of the small rectangle. Last, subtract the area of the small rectangle from the area of the big rectangle to find the shaded area of the figure.

6. (a) $(x - 8)(x + 8)$; (b) 836 cm²; 7. Length is 8 m, Width is 5 m;

8. (b) $4x^2 + 60x$, (c) 3 m; 9. 2 cm