Name _____ Date _____

Factoring Trinomials of the Form $x^2 + bx + c$

Directions: Each question is about factoring a trinomial of the form $x^2 + bx + c$. You can check any factored form by multiplying it back out.

1. To factor $x^2 + 9x + 20$ as $(x + p)(x + q)$, what must be true of the numbers p and q?

A. $pq = 20$ and $p + q = 9$
B. $p + q = 20$ and $p - q = 9$
C. $pq = 20$ and $p - q = 9$
D. $pq = 9$ and $p + q = 20$

2. Which product of two binomials is the factored form of $x^2 + 11x + 24$?

A. $(x + 3)(x + 8)$ B. $(x - 3)(x - 8)$ C. $(x + 2)(x + 12)$ D. $(x + 4)(x + 6)$

3. The trinomial $x^2 - 9x + 18$ factors as $(x + p)(x + q)$, where p and q are integers. Which statement about p and q is true?

A. One is positive and one is negative, and the positive one is farther from zero.
B. Both p and q are positive.
C. One is positive and one is negative, and the negative one is farther from zero.
D. Both p and q are negative.

4. What is the factored form of $x^2 + 2x - 35$?

A. $(x + 35)(x - 1)$ B. $(x + 7)(x - 5)$ C. $(x + 7)(x + 5)$ D. $(x - 7)(x + 5)$

5. Match each trinomial to its factored form. Watch the signs.

Write the letter of the matching answer on each line.

1. _____ $x^2 + 7x + 10$
2. _____ $x^2 - 7x + 10$
3. _____ $x^2 + 3x - 10$
4. _____ $x^2 - 3x - 10$

A. $(x + 10)(x - 1)$
B. $(x - 10)(x + 1)$
C. $(x + 5)(x - 2)$
D. $(x - 2)(x - 5)$
E. $(x - 5)(x + 2)$
F. $(x + 2)(x + 5)$

6. Omar factored $x^2 - 2x - 24$ as $(x - 6)(x + 4)$. To check, he multiplies the two factors. Which line shows the correct product before like terms are combined?

A. $x^2 + 4x - 6x + 24$
B. $x^2 - 24$
C. $x^2 + 4x + 6x - 24$
D. $x^2 + 4x - 6x - 24$

7. Tasha factored $x^2 - 4x - 21$, but her work has a mistake.

1. I need two numbers with a product of -21 and a sum of -4.
2. The numbers 7 and -3 work.
3. So $x^2 - 4x - 21 = (x + 7)(x - 3)$.

Where does her work first go wrong?

A. I need two numbers with a product of -21 and a sum of -4.
B. So $x^2 - 4x - 21 = (x + 7)(x - 3)$.
C. The numbers 7 and -3 work.

8. The trinomial $x^2 + bx - 24$ factors as $(x + 8)(x - 3)$, so the two are equal for every value of x. What is the value of b?

_____

9. For which of these values of b can $x^2 + bx + 12$ be factored as $(x + p)(x + q)$, where p and q are integers? Select the three correct values.

☐ A. $b = 13$ ☐ B. $b = 12$ ☐ C. $b = 6$

☐ D. $b = 8$ ☐ E. $b = 7$

10. Only one of these trinomials cannot be factored as $(x + p)(x + q)$ with integers p and q. Which one is it?

A. $x^2 + 6x + 10$ B. $x^2 - 6x + 5$ C. $x^2 + 6x + 8$ D. $x^2 + 6x - 16$