

Algebra 2
Quiz 4.4-4.6

NAME _____

Write the letter for the best answer.

Factor each polynomial. Only one of the factors is listed for the correct answer.

1. $3x^3 + 21x^2 + 36x$

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

2. $2x^2 - 50$

- A. 5
- B. $(x - 25)$
- C. $(x + 25)$
- D. $(x - 5)$

3. $4x^2 + 18x - 10$

- A. $(2x - 1)$
- B. $(2x + 5)$
- C. $(x - 5)$
- D. $(4x - 2)$

4. $2x^2 - 20x - 48$

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

5. $x^3 + 3x^2 - 4x - 12$

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

6. $6x^2 + 15x - 36$

- A. $(x - 4)$
- B. $(2x - 3)$
- C. $(6x - 3)$
- D. $(3x + 9)$

Determine if the binomial is a factor. If yes, factor completely (only one factor is listed).

7. $x^3 + 5x^2 - 2x - 24; x + 3$

- A. No
- B. Yes, $(x - 4)$
- C. Yes, $(x - 3)$
- D. Yes, $(x - 2)$

8. $x^3 + x^2 - 22x - 40; x - 5$

- A. No
- B. Yes, $(x - 4)$
- C. Yes, $(x + 5)$
- D. Yes, $(x + 2)$

Solve the equation.

9. $3x^3 - 27x = 0$

- A. 0, 3, -3
- B. 3, -3
- C. 0, 9, -9
- D. 9, -9

10. $3x^2 - 5x - 12 = 0$

- A. $-\frac{1}{3}, 4$
- B. $\frac{1}{3}, -4$
- C. $-\frac{4}{3}, 3$
- D. $\frac{4}{3}, -3$

11. $4x^3 + 20x^2 = 45 + 9x$

- A. $-9, -\frac{9}{4}, \frac{9}{4}$
- B. $9, -\frac{9}{4}, \frac{9}{4}$
- C. $-5, -\frac{3}{2}, \frac{3}{2}$
- D. $5, -\frac{3}{2}, \frac{3}{2}$

Find the zeros of each function by graphing.

12. $f(x) = x^4 + 2x^3 - 15x^2$

- A. 0,5,-3
- B. 0,3,-5
- C. 0,1,-15
- D. 0,15,-1

13. $f(x) = -x^4 + 9x^2$

- A. 0,3,-3
- B. 3,-3
- C. 0,2,-2
- D. 2,-2

Identify the number of solutions of the polynomial equation. Then find the solution(s).

14. $x^3 - x^2 - 6x - 24 = 0$

- A. 3; $-4, \frac{-3 \pm i\sqrt{5}}{2}$
- B. 3; $-4, 3 \pm \sqrt{15}$
- C. 3; $4, \frac{-3 \pm i\sqrt{15}}{2}$
- D. 3; $4, 3 \pm i\sqrt{15}$

15. $x^3 + 6x^2 + 18x + 20 = 0$

- A. 3; $-2, -2 \pm i\sqrt{6}$
- B. 3; $-2, 3 \pm 4\sqrt{3}$
- C. 3; $-2, \frac{6 \pm 4\sqrt{3}}{2}$
- D. 3; $-2, 3 \pm 2\sqrt{3}$

Find all the zeros of the polynomial function.

16. $x^4 - 4x^3 + 6x^2 - 4x - 80 = 0$

- A. $-1, 6, 2 \pm 2i$
- B. $1, -6, 2 \pm 4i$
- C. $2, -4, 1 \pm 2i$
- D. $-2, 4, 1 \pm 3i$

17. $x^4 - 6x^3 + 18x^2 - 14x - 39 = 0$

- A. $1, 3, 3 \pm 2i$
- B. $-1, 3, 2 \pm 3i$
- C. $1, -3, 3 \pm 2i$
- D. $-1, -3, 2 \pm 3i$

Write a polynomial function f of least degree that has rational coefficients and the given zeros.

18. 2,3,-4

- A. $x^3 - x^2 - 12x + 20$
- B. $x^3 - x^2 - 14x + 24$
- C. $x^3 - 3x^2 + 6x + 16$
- D. $x^3 + 3x^2 - 6x + 18$

19. $-2, 5, -i$

- A. $x^4 - 3x^3 - 9x^2 - 3x - 10$
- B. $x^4 + x^3 - 10x^2 + 2x - 14$
- C. $x^3 + 2x^2i + 6x^2 + xi - 10x - 14i$
- D. $x^3 - 2x^2i + 8x^2 - xi - 8x - 16i$

Determine the possible number of positive real zeros, negative real zeros, and imaginary zeros for the function.

20. $3x^3 - 2x^2 - 4x + 1$

- A. 0+; 1- or 3-; 2i or 0i
- B. 1+; 0- or 2-; 2i or 0i
- C. 2+ or 0+; 1-; 0i or 2i
- D. 2+ or 0+; 0-; 1i or 3i

21. $x^4 - 7x^3 - 5x^2 + x - 3$

- A. 2+ or 0+; 2-; 2i or 0i
- B. 3+ or 1+; 0-; 3i or 1i
- C. 2+ or 0+; 0-; 2i or 0i
- D. 3+ or 1+; 1-; 0i or 2i