Name:_____

Algebra 1 Final Review

1. Find $(3x + 2)(4x^2 – 2x – 7)$.

A $12x^3 + 2x^2 – 25x – 14$ **B** $12x^3 + 14x^2 + 25x + 14$ **C** $7x^3 + 9x^2 – 25x – 14$

D $7x^3 + 7x^2 – 4x – 5$ **E** $7x^3 + 2x^2 - 25x - 14$

2. Factor $7x^2 – 16x + 4$.

A $(x – 3)(7x + 5)$ **B** $(x + 2)(7x – 4)$ **C** $(x – 4)(7x + 1)$ **D** $(x – 2)(7x – 2)$ **E** $(x + 3)(7x - 5)$

3. Solve $x(x + 3) – 2 = 2 + x(x + 1)$.

A 2 **B** –2 **C** 1 **D** 0 **E** - 1

4. Which binomial is a factor of $80y^2 – 120y + 45$?

A $4y – 3$ **B** $8y – 9$ **C** $16y – 9$ **D** $8y – 15$ **E** $8y + 9$

5. Simplify $2a^2(5a – 6) – 5a\ (a^2 – 3a + 4) – 7(a – 5)$.

A $5a^3 + 3a^2 – 27a + 35$ **B** $5a^3 – 27a^2 + 13a – 35$ **C** $5a^3 – 10a – 7$

D $5a^3 - 3a^2 + 12a + 35$ **E** None of these

6. Factor $24x^2y – 66xy^2 + 54x^2y^2$ completely.

A $2xy(12x – 33y + 27xy)$ **B** $(4x^2 + 6y)(6x – 9y^2)$ **C** $6x^2y^2\ (4y – 11x + 9)$

D $6x^2y^2(4x - 11x - 9y)$ **E** $6xy(4x – 11y + 9xy)$

7. Solve $0 = (3w + 4)(2w – 7)$

A $\left\{-\frac{3}{4}, \frac{2}{7}\right\}$ **B** $\left\{\frac{3}{4}, -\frac{2}{7}\right\}$ **C** $\left\{\frac{4}{3}, \frac{2}{7}\right\}$ **D** $\left\{\frac{4}{3}, -\frac{7}{2}\right\}$ **E** $\left\{-\frac{4}{3}, \frac{7}{2}\right\}$

8. Factor $x^2 - 10x + 9$.

A $(x - 1)(x - 9)$ **B** $(x - 1)(x + 9)$ **C** $(x + 1)(x + 9)$ **D** $(x + 1)(x - 9)$ **E** $(x - 10)(x + 1)$

9. Find $(4a^2 + b)^2$.

A $16a^4 + b^2$ **B** $8a^4 + b^2$ **C** $16a^4 + 8a^2b + b^2$

D $4a^4 + 8a^2b + b^2$ **E** $8a^4 + 8a^2 + b^2$

10. Factor $121r^2 - 64t^2$.

A $(11r + 8t)(11r - 8t)$ **B** $(11r + 8t)(11r + 8t)$ **C** $(11r - 8t)(11r - 8t)$

D $(121r + 8t)(r - 8b)$ **E** prime/non factorable

11. The length of a rectangle is twice the width. The area is 72 square centimeters. What is the length?

A 48 cm **B** 24 cm **C** 12 cm **D** 6 cm **E** 18 cm

12. Solve $v^2 = 13v - 42$.

A {–6, –7} **B** {6, 7} **C** {–6, 7} **D** {6, –7} **E** $\{-10, -3\}$

13. Consider the equation $y = x^2 + 5x - 6$. Determine whether the function has a maximum or minimum value. State the maximum of minimum value. What are the domain and range of the function?

A min.; (0, 0)
D: {all real numbers}
R: {all real numbers}

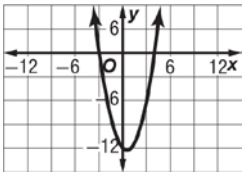
B max.; (0, 0)
D: {all real numbers}
R: $\{y \mid y \leq 0\}$

C min.; (–2.5, –12.25)
D: {all real numbers}
R: $\{y \mid y \geq -12.25\}$

D max.; (2.5, –12.25)
D: $x \mid x \leq 2.5$
R: {all real numbers}

E min.; (-6, 1)
D: {all real numbers}
R: $\{y \mid y \geq 1\}$

14. Which equation corresponds to the graph shown?



A $y = x^2 + 7x - 12$ **B** $y = x^2 + 5x + 12$ **C** $y = x^2 - x - 12$

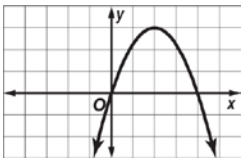
D $y = x^2 + 12x - 1$ **E** $y = 2(x - 1)^2 - 12$

15. Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of $y = 2x^2 - 12x + 6$.

A $x = -3$; (–3, 60) **B** $x = 3$; (3, –12) **C** $x = -3$; (–3, 78)

D $x = 3$; (3, 6) **E** $x = 3$; (3, 6)

16. What are the zeros of the quadratic equation whose related function is graphed at the right?



A 2 **B** 3 **C** 0, 4 **D** –4, 0 **E** 2, 3

17. Describe how is the function $g(x) = (x + 3)(x - 1)$ is related to the function $f(x) = x^2$?

A translated left 3 units & down 1 **B** translated left 1 **C** translated right 1

D translated left 1 & down 4 **E** translated right 1 & up 4

18. How is the parent function $f(x) = x^2$ translated to create the graph of $g(x) = (x - 3)^2 + 2$?

A down 2 units **B** right 3 units & up 2 units **C** left 3 units & up 2 units

D up 2 units **E** left 3 units & down 2 units

19. What is the vertex form of $n^2 - 12n - 10 = 0$?

A $0 = (n + 6)^2 + 26$ **B** $0 = (n - 6)^2 - 46$ **C** $0 = (n - 12)^2 + 134$

D $0 = (n - 5)(n + 2)$ **E** $0 = (n - 6)^2 + 26$

20. Which equation is equivalent to $2x^2 - 24x - 14 = 0$?

A $(x - 6)^2 = 50$ **B** $(x - 3)^2 = 13$ **C** $(x - 3)^2 = 20$

D $(x - 6)^2 = 43$ **E** $2(x - 6)^2 = 43$

For Questions 21-23, simplify each expression.

21. $5\sqrt{3} \cdot 2\sqrt{21}$

A $70\sqrt{3}$ **B** $10\sqrt{63}$ **C** $49\sqrt{3}$ **D** $30\sqrt{7}$ **E** $7\sqrt{24}$

22. $\sqrt{\frac{x^2}{12}}$

A $\frac{x^2}{2\sqrt{3}}$ **B** $\frac{x\sqrt{3}}{6}$ **C** $\frac{x}{6}$ **D** $\frac{x}{\sqrt{12}}$ **E** $\frac{x}{\sqrt{6}}$

23. $2\sqrt{y} \cdot 5\sqrt{y} \cdot 2\sqrt{y}$.

A $20\,y\sqrt{y}$ **B** $20\sqrt{y}$ **C** $20y^2\sqrt{y}$ **D** $20y^3$ **E** $20\sqrt{y^3}$

For Questions 24-25, solve the equation by using the Quadratic Formula.

24. $4x^2 + 11x - 3 = 0$

A $\frac{-11 \pm \sqrt{73}}{8}$ **B** $-\frac{1}{4}, 3$ **C** $\frac{11 \pm \sqrt{73}}{8}$ **D** $-3, \frac{1}{4}$ **E** no solutions

25. $y^2 + 2y + 3 = 0$

A -1, -2 **B** -3,-1 **C** 1, 2 **D** 3, 1 **E** no solutions

26. Determine the number of real solutions of $7x^2 - 18x + 12 = 0$.

A 2 **B** infinitely many **C** none **D** 1 **E** 12

27. Look for a pattern in the table of values to determine which model best describes the data.

x	0	1	2	3
y	1	7	49	343

A linear **B** exponential **C** quadratic **D** rational **E** none of these

28. How does the translated graph of $y = \sqrt{x + 3}$ compare to the parent graph?

A translated up 3 **B** translated down 3 **C** translated right 3

D translated left 3 **E** no change

29. Which equation has a domain of $\{x \mid x \geq 2\}$?

A $y = \sqrt{x} + 2$ **B** $y = \sqrt{x} - 2$ **C** $y = \sqrt{x + 2}$ **D** $y = \sqrt{x - 2}$ **E** $y = \frac{x}{2}$

30. $\sqrt{18} - \sqrt{54} + 2\sqrt{50}$

A $13\sqrt{2} - 3\sqrt{6}$ **B** $-4\sqrt{3} + 4\sqrt{5}$ **C** $-4\sqrt{3} - 4\sqrt{5}$ **D** $8\sqrt{2} - 3\sqrt{6}$ **E** $2\sqrt{6}$

31. $(\sqrt{14} + \sqrt{3})(\sqrt{6} - \sqrt{17})$

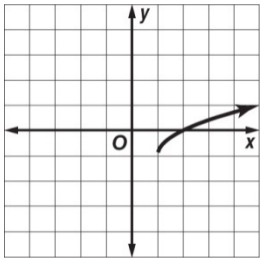
A $2\sqrt{5} - \sqrt{21} + 3 - \sqrt{10}$ **B** $\sqrt{21} - 4\sqrt{2}$ **C** $\sqrt{21}$

D $\sqrt{21} + \sqrt{2}$ **E** $2\sqrt{21} - \sqrt{238} + 3\sqrt{2} - \sqrt{51}$

32. Solve $\sqrt{3x - 2} + 4 = 8$.

A 12 **B** 6 **C** $\frac{2}{3}$ **D** $\frac{3}{2}$ **E** $\frac{50}{3}$

33. What is the equation of the graph?

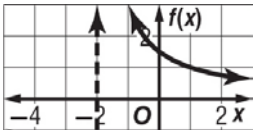


A $y = \sqrt{x + 1} - 1$ **B** $y = \sqrt{x - 1} - 1$

C $y = \sqrt{x + 1} + 1$ **D** $y = \sqrt{x - 1} + 1$

E $y = 2x - 1$

34. Which rational function is graphed?



A $f(x) = \frac{3}{x+2}$ **B** $f(x) = \frac{3}{x-2}$ **C** $f(x) = \frac{x}{x+2}$

D $f(x) = \frac{x}{x-2}$ **E** $x = -2$

35. Solve $\frac{x-1}{4} = \frac{3x}{6}$

A -1 **B** $\frac{-1}{6}$ **C** $\frac{-1}{3}$ **D** 1 **E** $\frac{1}{2}$

36. Solve $\frac{5x}{3x+3} - \frac{10}{3(x+1)} = \frac{7}{6}$.

A 9 **B** $-\frac{27}{11}$ **C** $\frac{67}{9}$ **D** $\frac{7}{3}$ **E** $\frac{17}{5}$

37. What is the domain and the range for the following functions?

A. $f(x) = \frac{1}{x+2} - 3$ B. $f(x) = \sqrt{x-3} + 4$ C. $f(x) = (x+1)^2 + 3$

Domain: Domain: Domain:

Range: Range: Range:

38. What value does *n* have on the graphed function to the right for (1, *n*)?