# Algebra 11 Study Guide for final

**Name:** _____     **Date:** _____

1. Divide $(x^3 - 2x^2 + 6x - 8)$ by $(x - 2)$

   A. $x^2 + 6 + \dfrac{4}{x-2}$

   B. $x^2 - 4x + 14 - \dfrac{36}{x-2}$

   C. $x^2 - 3x + 1 - \dfrac{9}{x-2}$

   D. $x^2 + x + 9 + \dfrac{3}{x-2}$

2. What is $(5x^3 - 2x)(3x^2 + x - 8)$?

   A. $5x^3 + 3x^2 - x - 8$

   B. $15x^5 - x^4 - 42x^3 + 16x$

   C. $15x^5 + 5x^4 - 46x^3 - 2x^2 + 16x$

   D. $15x^6 - 35x^3 - 6x^2 + 14x$

3. Which is a factor of $x^2 - 11x + 24$?

   A. $x + 3$   B. $x - 3$   C. $x + 4$   D. $x - 4$

4. $(4x^2 - 2x + 8) - (x^2 + 3x - 2) =$

   A. $3x^2 + x + 6$      B. $3x^2 + x + 10$

   C. $3x^2 - 5x + 6$     D. $3x^2 - 5x + 10$

5. Which of the following is equivalent to the expression below?

$$(3x + 6y) + (2x - y)$$

   A. $5x - y$      B. $5x + 7y$

   C. $6x - 6y$     D. $5x + 5y$

6. Simplify.

$$\frac{4x^3 + 2x^2 - 8x}{2x}$$

   A. $2x^2 + x - 4$     B. $4x^2 + 2x - 8$

   C. $2x^2 + 2x^2 - 8x$    D. $8x^4 + 4x^3 - 16x^2$

7. What is $\dfrac{x^2 - 4x + 4}{x^2 - 3x + 2}$ reduced to lowest terms?

   A. $\dfrac{x-2}{x-1}$   B. $\dfrac{x-2}{x+1}$   C. $\dfrac{x+2}{x-1}$   D. $\dfrac{x+2}{x+1}$

8.  What are the roots of $0 = 9x^2 - 49$

    A.  $\pm 7$    B.  $\pm 3$    C.  $\pm\frac{49}{9}$    D.  $\pm\frac{7}{3}$

9.  Carter is solving this equation by factoring.

    $$10x^2 - 25x + 15 = 0$$

    Which expression could be one of his correct factors?

    A.  $x + 3$    B.  $x - 3$    C.  $2x + 3$    D.  $2x - 3$

10. What is the product of $(3xy^2)(2x2y^3)$?

    A.  $5x^3y^6$            B.  $5x^2y^6$

    C.  $6x^2y^6$            D.  $12x^2y^5$

11. The expression $\log\dfrac{\sqrt[3]{a}}{b}$ is equivalent to

    A.  $\frac{1}{3}\log a - \log b$        B.  $\frac{1}{3}\log(a-b)$

    C.  $3\log a - \log b$        D.  $3\log(a-b)$

12. If $x = u^2v$, which expression is equivalent to $\log x$?

    A.  $2\log u + \log v$        B.  $\log 2u + \log v$

    C.  $\dfrac{2\log u}{\log v}$        D.  $2\log u \log v$

13. The expression $\log a + \frac{1}{2}\log b$ is equivalent to

    A.  $\log\sqrt{ab}$        B.  $\log a\sqrt{b}$

    C.  $\log(a + \sqrt{b}\,)$        D.  $(\log a)\left(\frac{1}{2}\log b\right)$

14. Which of the following is a simplified form of the expression $\log_{21} 5 + \log_{21} 4 - \log_{21} 2$?

    A.  $\log_{21} 10$        B.  $\log_{10} 21$

    C.  $\log_{21} 7$        D.  $\log_7 21$

15. The expression $\dfrac{\left(10w^3\right)^2}{5w}$ is equivalent to

    A.  $2w^5$    B.  $2w^8$    C.  $20w^5$    D.  $20w^8$

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16. Which expression is equivalent to $(3x^2)^3$ ?

    A. $9x^5$    B. $9x^6$    C. $27x^5$    D. $27x^6$

17. $(5x^2y^3)^2(4x^7y^4)$ is equivalent to:

    A. $100x^{11}y^{10}$       B. $100x^{11}y^9$

    C. $100x^{28}y^{24}$      D. none of the above

18. The coefficient of $x^3$ in the binomial expansion of $(x+2)^7$ is

    A. 112    B. 168    C. 560    D. 1120

19. Which expression is equivalent to $\dfrac{8a^6}{2a^3}$?

    A. $6a^2$    B. $6a^3$    C. $4a^2$    D. $4a^3$

20. The solution set of $x^2 - 64 = 0$ is

    A. $\{8, -8\}$       B. $\{-8\}$

    C. $\{8\}$         D. $\{16, -4\}$

21. What is the solution set of the equation $x^2 - 3x - 10 = 0$?

    A. $(5, -2)$       B. $(-5, -2)$

    C. $(5, 2)$        D. $(-5, 2)$

22. Find the positive solution for the equation $4x^2 = 64$.

23. Which is the solution set of the equation $2x^2 + 3x - 2 = 0$?

    A. $\left\{-\frac{1}{2}, 2\right\}$       B. $\left\{\frac{1}{2}, -2\right\}$

    C. $\left\{\frac{1}{2}, 2\right\}$        D. $\left\{-\frac{1}{2}, -2\right\}$

24. Which is one of the solutions to the equation

$$2x^2 - x - 4 = 0?$$

    A. $\dfrac{1}{4} - \sqrt{33}$       B. $-\dfrac{1}{4} + \sqrt{33}$

    C. $\dfrac{1 + \sqrt{33}}{4}$       D. $\dfrac{-1 - \sqrt{33}}{4}$
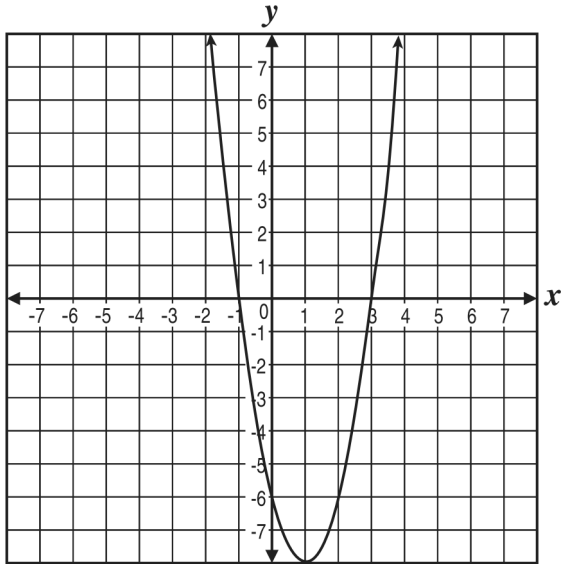
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25. Which is an equation of the axis of symmetry of the parabola whose equation is $y = 3x^2 - 12x - 13$?

A. $x = -4$    B. $x = 2$

C. $x = 3$    D. $x = 4$

26. What is the $y$-intercept of the parabola whose equation is $y = x^2 + 5x - 6$?
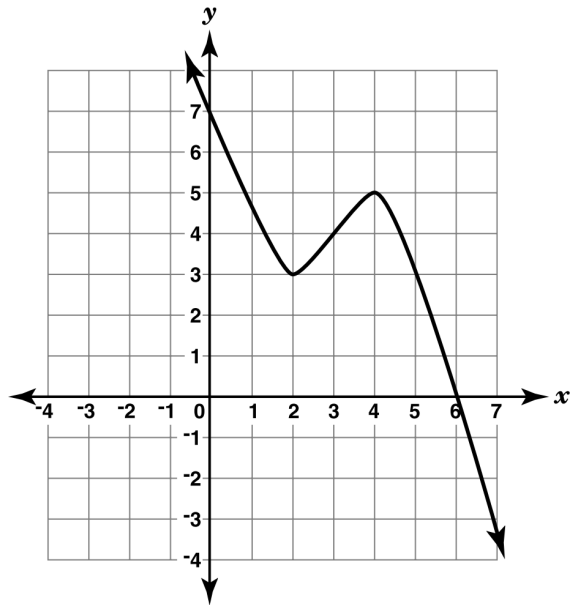
A. 1    B. $-1$    C. 6    D. $-6$

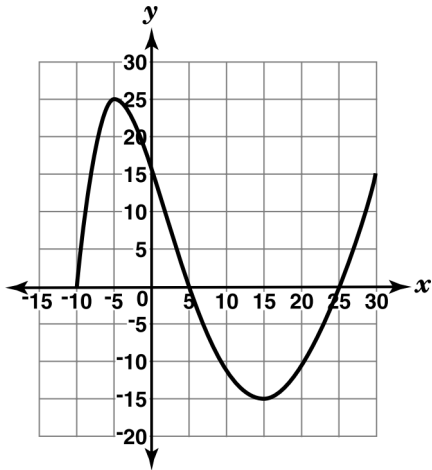27. What are the real roots of the function in the graph?



A. 3    B. $-6$

C. $-1$ and 3    D. $-6, -1$, and 3

28. Look at the function that is graphed below.



What is the zero of this function?

29. Look at the function that is graphed below.



What are the maximum and minimum values of this function?

A. maximum 15, minimum $-5$

B. maximum 25, minimum $-15$

C. maximum 25, minimum $-10$

D. maximum 30, minimum $-10$

30. Sam graphs the function $f(x) = (x - 6)^2 + 5$.

The graph of the function is shown.
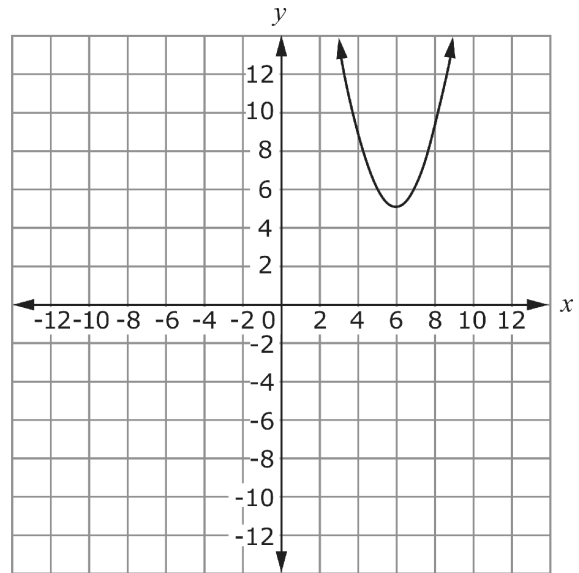


What is the **vertex** of Sam's graph?

A. $(-6, 5)$      B. $(5, 6)$      C. $(6, 5)$

31. What are the $x$-intercepts for the function $f(x) = x^2 + 2x - 15$?

A. $(0, -5), (0, 3)$      B. $(0, 5), (0, -3)$

C. $(5, 0), (-3, 0)$      D. $(-5, 0), (3, 0)$

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32. What are the vertical asymptotes of the function
$f(x) = \dfrac{4x^2 - 100}{2x^2 + x - 15}$ ?

   A. $x = -5, x = 5$

   B. $x = -5, x = 4, x = 5$

   C. $x = -3, x = \dfrac{5}{2}$

   D. $x = -3, x = \dfrac{5}{2}, x = \dfrac{20}{3}$

33. The coordinates of the turning point of the graph of $y = 2x^2 - 4x + 1$ are

   A. $(1, -1)$          B. $(1, 1)$

   C. $(-1, 5)$          D. $(2, 1)$

34. Which is equal to $\sqrt{1800}$ in simplest radical form?

   A. $2\sqrt{900}$          B. $10\sqrt{18}$

   C. $30\sqrt{2}$          D. $60$

35. What is the value of the expression?

   $$\dfrac{\sqrt{(3 - 2 + 4)^2}}{(4 \cdot 2 - 7)^3}$$

   A. $-\dfrac{1}{4}$     B. $1$     C. $\dfrac{2}{3}$     D. $5$

36. $\sqrt{16} + \sqrt[3]{8} =$

   A. $4$          B. $6$          C. $9$          D. $10$

37. What is the value of the expression below?

   $(^3\sqrt{125})^3$

   A. $5$          B. $25$          C. $75$          D. $125$

38. The sum of $\sqrt{12}$ and $5\sqrt{3}$ is

   A. $10\sqrt{3}$     B. $7\sqrt{6}$     C. $7\sqrt{3}$     D. $360$

39. The expression $2\sqrt{3} - \sqrt{27}$ is equivalent to

   A. $2\sqrt{24}$     B. $5\sqrt{3}$     C. $-5\sqrt{3}$     D. $-\sqrt{3}$

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40. Which of the following *most* accurately describes the translation of the graph $y = (x + 3)^2 - 2$ to the graph of $y = (x - 2)^2 + 2$?

    A.   up 4 and 5 to the right

    B.   down 2 and 2 to the right

    C.   down 2 and 3 to the left

    D.   up 4 and 2 to the left

41. Given $y = x^2$, how would the graph of $y = x^2 - 2$ differ?

    A.   It shifts 2 units up.

    B.   It shifts 2 units down.

    C.   It shifts 2 units left.

    D.   It shifts 2 units right.

42. Emily graphed the function $y = x^2 + 2$. Mark graphed $y = 0.5x^2 + 2$. If they both used the same grid scale, which statement describes Mark's graph compared to Emily's graph?

    A.   Mark's graph is wider.

    B.   Mark's graph is narrower.

    C.   Mark's graph has a lower $y$-intercept.

    D.   Mark's graph has a higher $y$-intercept.

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1.
Answer:          A
Objective:       1.03
Points:          1

2.
Answer:          C
Objective:       2A.3.0
Points:          1

3.
Answer:          B
Objective:       1A.11.0
Points:          1

4.
Answer:          D
Objective:       1A.10.0
Points:          1

5.
Answer:          D
Objective:       MA 10.P.3
Points:          1

6.
Answer:          A
Objective:       1A.10.0
Points:          1

7.
Answer:          A
Objective:       1A.12.0
Points:          1

8.
Answer:          D
Objective:       4.02
Points:          1

9.
Answer:          D
Objective:       1A.14.0
Points:          1

10.
Answer:          D
Objective:       30609
Points:          1

11.
Answer:          A
Points:          1

12.
Answer:          A
Points:          1

13.
Answer:          B
Points:          1

14.
Answer:          A
Objective:       2A.14.0
Points:          1

15.
Answer:          C
Points:          1

16.
Answer:          D
Points:          1

17.
Answer:          A
Points:          1

18.
Answer:          C
Points:          1

19.
Answer:          D
Objective:       7.AF.2.2
Points:          1

20.
Answer:          A
Points:          1

21.
Answer:          A
Points:          1

22.
Answer:          4
Points:          1

23.
Answer:          B
Points:          1

24.
Answer:          C
Objective:       1A.20.0
Points:          1

25.
Answer:          B
Points:          1

26.
Answer:          D
Points:          1

27.
Answer:          C
Objective:       1A.21.0
Points:          1

28.
Answer:          5.9 to 6.1
Objective:       1.1.4
Points:          1

29.
Answer:          B
Objective:       1.1.4
Points:          1

30.
Answer:
Points:          1

31.
Answer:
Objective:       A4D10
Points:          1

32.
Answer:          C
Points:          1

33.
Answer:          A
Points:          1

34.
Answer:          C
Objective:       M1.4.4
Points:          1

35.
Answer:          D
Objective:       1-2-5
Points:          1

36.
Answer:          B
Objective:       1A.2.0
Points:          1

37.
Answer:          D
Objective:       MA 10.N.1
Points:          1

38.
Answer:          C
Points:          1

39.
Answer:          D
Points:          1

40.
Answer:          A
Objective:       2A.9.0
Points:          1

41.
Answer:          B
Objective:       2.1.E
Points:          1

42.
Answer:          A
Points:          1