

1. The expression below shows how many blocks Alma uses to build a planter.

$$5^3 - 3^3$$

How many blocks does Alma use to build the planter?

- A 6
- B 8
- C 98
- D 11

2. The floor of an art gallery is a square with an area of 62,500 square feet. How can the length of one side of the floor be found?

- A $62,500^2$
- B $\sqrt{62,500}$
- C $62,500 \cdot 2$
- D $62,500 \div 2$

3. Which operation should be performed first to evaluate the expression $[12 - 5(4x)^2] \div 2$?

- A $12 - 5$
- B $5(4x)$
- C $(4x)^2$
- D $(4x)^2 \div 2$

4. Which expression shows another way to write $(4^3)^3$?

- A 4^{3-3}
- B $4^{3 \div 3}$
- C 4^{3+3}
- D $4^{3 \times 3}$

5. What kind of number results from simplifying $\frac{9\pi}{6\pi}$?

- A a whole number
- B a repeating decimal
- C a terminating decimal
- D a non-repeating decimal that does not terminate

6. Ronnie is trying to solve the equation below.

$$\sqrt{x} = 81$$

What should Ronnie do first to find the value of x?

- A divide 81 by 2
- B square 81
- C find the square root of 81
- D multiply 81 by 2

7. Which expression shows the result of doubling $\sqrt{3} + \sqrt{2}$?

- A $\sqrt{10}$
- B $2\sqrt{5}$
- C $2\sqrt{3} + 2$
- D $2\sqrt{3} + 2\sqrt{2}$

8. A dog weighs 36 pounds. Which expression represents the dog's weight in pounds?

- A $3^1 + 6^2$
- B $3^{10} + 6^1$
- C $3^2 + 3^3$
- D $30^1 + 3^2$

12. What is the value of the expression?

$$\sqrt{64x^{16}y^4}$$

- A $8x^4y^2$
- B $8x^8y^2$
- C $32x^4y^2$
- D $32x^8y^2$

13. What is the solution to the equation shown?

$$\sqrt{3x - 1} = 8$$

- A 3
- B $\frac{17}{3}$
- C $\frac{65}{3}$
- D 27

14. What is the simplest form of the expression below?

$$\frac{x^5}{x^2(x)}$$

- A x^2
- B x^3
- C x^7
- D x^8

15. Simplify the expression $(-8x^3)(3x^5)$.

- A $-5x^2$
- B $-5x^8$
- C $-24x^8$
- D $-24x^{15}$

16. What is the simplest form of $\frac{\sqrt{15}}{\sqrt{81}}$?

- A $\frac{3\sqrt{5}}{9}$
- B $\frac{3\sqrt{5}}{9}$
- C $\frac{\sqrt{15}}{9}$
- D $\frac{\sqrt{15}}{\sqrt{81}}$

17. Simplify $\sqrt{\frac{125}{36}}$ completely.

- A $\frac{5\sqrt{5}}{6}$
- B $\frac{\sqrt{125}}{6}$
- C $\frac{\sqrt{4,500}}{36}$
- D cannot be simplified

18. Evaluate the algebraic expression below when $a = 4$ and $x = 5$.

$$\sqrt{a} - x(3 + a^2) - 10$$

- A -43
- B -67
- C -103
- D -253

19. What is the simplest form of the radical expression below?

$$\sqrt{\frac{27}{169}}$$

- A $\frac{\sqrt{27}}{13}$
- B $\frac{9\sqrt{3}}{13}$
- C $\frac{3\sqrt{3}}{13}$
- D $\frac{3\sqrt{3}}{\sqrt{169}}$

20. Use the laws of exponents to evaluate $\left(\frac{1}{x}\right)^{-n}$ when $x = 7$ and $n = 2$.

- A $\left(\frac{1}{49}\right)$
- B $\left(\frac{1}{7}\right)$
- C 7
- D 49

21. What is the value of $5\sqrt{3} - \sqrt{75}$?

- A 0
- B $10\sqrt{3}$
- C $-20\sqrt{3}$
- D cannot be subtracted

22. Simplify the expression below.

$$(5t)(-30t^2)$$

- A $-150t^3$
- B $150t^3$
- C $-25t^3$
- D $-6t$

23. What is the simplified form of the expression below?

$$\sqrt{4} + 2\sqrt{3} - \sqrt{4}$$

- A $2\sqrt{3}$
- B $2\sqrt{7}$
- C $\sqrt{4} + 2\sqrt{3}$
- D $2\sqrt{4} + 2\sqrt{3}$

24. If a family tree is traced back n generations, 2^n ancestors, at most, will be found in that generation. At most, how many ancestors would be found when tracing back 8 generations?

- A 8
- B 16
- C 64
- D 256

25. What is $\sqrt{\frac{64}{16}}$ expressed in simplest form?

- A $\frac{1}{2}$
- B 2
- C 4
- D 8

26. What is the simplest form of the expression below?

$$\frac{10x^4 + 50x^3}{2x^3}, \text{ if } x \neq 0$$

- A $5x^4 + 25x^3$
- B $5x + 25$
- C $8x + 48$
- D $5x$

27. What is the simplest form of the expression below?

$$-2x(x^2 + 2x)$$

- A $-2x^3 - 4x^2$
- B $-2x^2 - 4x$
- C $2x^3 + 4x^2$
- D x^2

28. Which is equivalent to the expression $6\sqrt{7} + \sqrt{6} - 3\sqrt{7}$?

- A 3
- B $3 + \sqrt{6}$
- C $6\sqrt{7} - 3$
- D $3\sqrt{7} + \sqrt{6}$

29. What is the simplest form of the expression below?

$$(4\sqrt{6})(\sqrt{3})$$

- A 12
- B 27
- C $7\sqrt{2}$
- D $12\sqrt{2}$

30. What is the simplified form of the fraction below?

$$\frac{5}{\sqrt{3}}$$

- A $\frac{\sqrt{15}}{3}$
- B $\sqrt{5}$
- C $\frac{5}{\sqrt{15}}$
- D $\frac{5\sqrt{3}}{3}$

31. What is the simplest form of the expression below?

$$\frac{14x^2(x+3x^5)}{7x^2} \text{ if } x \neq 0$$

- A $x + 3x^5$
- B $2x + 6x^5$
- C $7x + 21x^5$
- D $2x^3 + 42x^7$

32. Assuming no denominator equals 0, which shows the expression

$$\frac{40x^3}{46x^2y} \text{ completely simplified?}$$

A $\frac{7x}{8y}$

B $\frac{20x}{23y}$

C $\frac{20x^3}{23x^2y}$

D $\frac{40x}{46y}$

33. What is the simplest form of the expression below?

$$4\sqrt{2} + 3\sqrt{2} - 5\sqrt{2}$$

A $2\sqrt{2}$

B $2\sqrt{6}$

C $7\sqrt{2}$

D $12\sqrt{2}$

34. Which shows the expression $\frac{4}{\sqrt{2}}$ in a correctly simplified form?

A $2\sqrt{2}$

B 8

C $\sqrt{2}$

D 2

35. Which is equivalent to the expression below?

$$\frac{9x^8y^3z^4}{3x^3y^4z^2}$$

A $\frac{3x^5z^2}{y}$

B $\frac{3x^{11}z^6}{y^7}$

C $\frac{6x^5z^2}{y}$

D $\frac{6x^{11}z^6}{y^7}$

36. Which expression is equivalent to $4x^2(2x^3 - 5x + 6)$?

A $8x^5 - 20x^3 + 24x^2$

B $8x^6 - 5x^2 + 24x^2$

C $8x^5 - x^3 + 24x^2$

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

37. Assuming no denominator equals 0, which shows the expression below in completely simplified form?

$$\frac{18x^2z^5 + 30x^3z^4}{2xz^4}$$

A $9z + 15x^2$

B $9xz + 15x^2$

C $12xz + 20x^2$

D $\frac{6xz^2(3xz^3 + 5x^2z^2)}{2xz^4}$

38. Which expression is equivalent to $4\sqrt{10} \cdot 3\sqrt{7}$?

A $12 + 3\sqrt{10} + 4\sqrt{7} + \sqrt{70}$

B $12\sqrt{70}$

C $60\sqrt{7}$

D 840

39. Which is equivalent to the expression $3\sqrt{5} + 2\sqrt{20}$?

A $7\sqrt{5}$

B $7\sqrt{10}$

C $11\sqrt{5}$

D 25

40. Which is the simplest form of the expression $\sqrt{\frac{48}{12}}$?

A $\frac{4\sqrt{2}}{2\sqrt{2}}$

B $4\sqrt{12}$

C 4

D 2

41. What is the simplest form of the expression $\frac{12b^5}{4b^4}$?

A $3b^9$

B $8b$

C $3b$

D 3

42. Simplify the expression below.

$$\frac{24m^2}{34mw}$$

A $\frac{24m}{34w}$

B $\frac{12m}{17w}$

C $\frac{12m^3}{17w}$

D $\frac{2m}{3w}$

43. What is the sum of $(3x - 2)$ and $(5x^2 + 3x)$?

A $5x^2 - 2$

B $5x^2 + 6x - 2$

C $8x^2 + 3x - 2$

D $15x^3 - 10x^2 + 3x$

44. Which expression is equivalent to $\frac{8xy^2}{24x^2y}$ for $x \neq 0, y \neq 0$?

A $\frac{1}{3}$

B $\frac{y}{3x}$

C $\frac{y^2}{3x}$

D $\frac{x}{3y}$

45. Consider the expression below.

$$\left(\frac{-1}{3x^4y^7}\right)^3$$

Which is an equivalent form of this expression?

A $\frac{-1}{27x^{12}y^{21}}$

B $\frac{1}{27x^{12}y^{21}}$

C $\frac{-1}{9x^7y^{10}}$

D $\frac{1}{9x^7y^{10}}$

46. What is the value of the expression $(\sqrt{3})(\sqrt{12})$?

A $\sqrt{6}$

B $2\sqrt{3}$

C 6

D 18

47. Which expression is equivalent to x^6x^2 ?

A x^4x^3

B x^5x^3

C x^7x^3

D x^9x^3

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

- A 4
- B 6
- C 9
- D 10

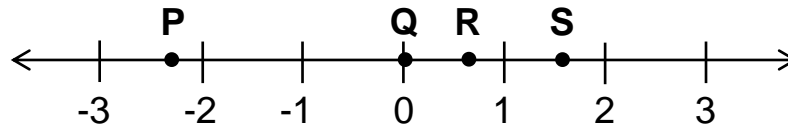
49. The sum of two binomials is $5x^2 - 6x$. If one of the binomials is $3x^2 - 2x$, what is the other binomial?

- A $2x^2 - 4x$
- B $2x^2 - 8x$
- C $8x^2 + 4x$
- D $8x^2 - 8x$

50. $\frac{5x^3}{10x^7} =$

- A $2x^4$
- B $\frac{1}{2x^4}$
- C $\frac{1}{5x^4}$
- D $\frac{x^4}{5}$

51. Which point on the number line represents a number that, when cubed, will result in a number greater than itself?



- A P
- B Q
- C R
- D S

52. For $y \neq 0$, $\frac{y^8}{y^2}$ is equivalent to:

- A 4
- B y^3
- C y^4
- D y^6

53. Divide: $(18m^5p^4 + 36m^7p^3 - 4m^3p)$ by $(2m^3p)$

- A $9m^2p^3 + 18m^4p^2 - 2$
- B $12m^2p^3 + 34m^4p^2 - 2$
- C $9m^2p^3 + 18m^4p^2 - 2mp$
- D $12m^2p^3 + 34m^4p^2 - 2mp$

54. Which is equivalent to $3x^2 \cdot 2x^4$?

- A $5x^6$
- B $5x^8$
- C $6x^6$
- D $6x^8$

55. Which expression is equivalent to $(g^6h^3)^3$?

- A g^9h^6
- B g^9h^9
- C $g^{18}h^6$
- D $g^{18}h^9$

56. Simplify: $\frac{15m^7c^6}{3mc^2}$

- A $5m^6c^3$
- B $5m^6c^4$
- C $5m^7c^4$
- D $12m^6c^4$

57. Simplify: $\sqrt{252}$

- A $6\sqrt{7}$
- B $7\sqrt{6}$
- C $7\sqrt{36}$
- D $36\sqrt{7}$

58. Simplify: $\sqrt{9d^{100}}$

- A $4.5d^{50}$
- B $3d^{50}$
- C $4.5d^{10}$
- D $3d^{10}$

59. What is the solution, rounded to the nearest tenth, of the algebraic equation below?

$$x = (6.73 \times 10^{-9})(2.54 \times 10^8)$$

- A $x = 1.7$
- B $x = 170.9$
- C $x = 1.7 \times 10^{-17}$
- D $x = 17.1 \times 10^{-72}$

60.

$x \cdot x^2 = x^3$
$x^2 \cdot x^2 = x^4$
$x^3 \cdot x^2 = x^5$
$x^4 \cdot x^2 = x^6$
$x^5 \cdot x^2 = x^7$

- A $x^m \cdot x^n = x^{(m+n)}$
- B $x^m \cdot x^n = x^{(n-m)}$
- C $x^m \cdot x^n = x^{(m-n)}$
- D $x^m \cdot x^n = x^{(m+m)}$