

1. Simplify the expression $\frac{4 - (5 - 3)^3}{5 - 3}$
 - a. -2
 - b. -1
 - c. 1
 - d. 2
 - e. none of these

2. Of these: $0/5$ $5/0$ 5^0 0^5 , which are equal?
 - a. $0/5 = 5/0$
 - b. $0/5 = 5^0$
 - c. $0^5 = 5^0$
 - d. $0/5 = 0^5$
 - e. $5/0 = 0^5$

3. If $\frac{1}{3} - \frac{1}{4} = \frac{1}{w}$, what is the value of w ?
 - a. 5
 - b. 6
 - c. 7
 - d. 12
 - e. none of these

4. One hundred square tiles, each 1 foot by 1 foot, are arranged to form a rectangle. If the length of the rectangle is 20 feet, what is its width?
 - a. 80 feet
 - b. 50 feet
 - c. 20 feet
 - d. 8 feet
 - e. 5 feet

5. The horizontal line passing through the point $(3,2)$ is described by which of the following equations?
 - a. $x = 2$
 - b. $y = 2$
 - c. $x = 3$
 - d. $y = 3$
 - e. $x + y = 5$

6. Solve for x , when $\frac{x-3}{2} = \frac{x-2}{3}$.
- 1
 - 5
 - 13
 - $13/5$
 - $-13/5$
7. The expression $\sqrt[3]{64} \times \sqrt{64}$ is equal to which of the following?
- 2
 - 32
 - 128
 - $\sqrt[5]{64}$
 - $64/3$
8. A jacket is marked \$50 and the sale sign reads, "take 30% off the marked price". What is the current selling price for the jacket?
- \$15
 - \$20
 - \$25
 - \$30
 - \$35
9. The expression $(2-x)^3$ is equivalent to which of the following?
- $8-4x-2x^2-x^3$
 - $8-4x+2x^2-x^3$
 - $8+4x+2x^2-x^3$
 - $8-x^3$
 - $8-12x+6x^2-x^3$
10. Determine the slope of the line passing through points (4,1) and (-2,4)
- $-1/2$
 - $-5/6$
 - $-6/5$
 - 2
 - 2
11. On the real number line, which numbers are larger than their squares?
- None
 - Only the positives
 - Only numbers between -1 and 1
 - Only numbers less than 1
 - Only numbers between 0 and 1

12. If a cube has a volume of 216 cm^3 , what is its surface area?

- a. 36 cm^2
- b. 48 cm^2
- c. 72 cm^2
- d. 144 cm^2
- e. 216 cm^2

13. Solve the formula $E = m \cdot c^2$ for c .

- a. $c = \sqrt{Em}$
- b. $c = \frac{\sqrt{E \cdot m}}{m}$
- c. $c = \frac{E}{m \cdot c}$
- d. $c = \frac{\sqrt{E}}{m}$
- e. $c = \frac{E^2}{m}$

14. Which of the following is a true statement about lines $4x - 3y = 6$ and $2x - y = 3$?

- a. The lines do not intersect.
- b. The lines meet at a point whose coordinates are both positive.
- c. The lines meet at a point whose coordinates are both negative.
- d. The lines meet at a point whose coordinates include one positive and one negative.
- e. The lines meet at a point whose coordinates include at least one zero.

15. Five square feet is equal to

- a. 12 square inches
- b. 60 square inches
- c. 144 square inches
- d. 720 square inches
- e. 3600 square inches

16. Evaluate $4x^2 - y$ if $x = 2$ and $y = -3$.

- a. 11
- b. 13
- c. 19
- d. 61
- e. 67

17. Simplify $(3^{-1} + 2^{-1})^{-1}$

- a. 5
- b. $\frac{5}{6}$
- c. $\frac{6}{5}$
- d. $\frac{1}{5}$
- e. $\frac{1}{6}$

18. A polygon has a perimeter of 16 inches and an area of 16 square inches. What is the shape of the polygon?

- a. square
- b. triangle
- c. hexagon
- d. a rectangle that is not a square
- e. a quadrilateral that is not a rectangle

19. Simplify $\frac{0.00785}{3.14}$

- a. 2.5
- b. 0.25
- c. 0.025
- d. 0.0025
- e. none of these

20. Chris is thinking of two numbers whose sum is 9 and whose difference is 3. What is the product of these two numbers?

- a. 3
- b. 6
- c. 12
- d. 15
- e. 18

21. Simplify $(a - b)^3 + (a + b)^3$

- a. $2b^3$
- b. $a^3 + b^3$
- c. $2a^3 + 3ab^2$
- d. $2a^3 + 6a^2b + 6ab^2 + 2b^3$
- e. none of these

22. Simplify this 100-term expression: $1 - 2 + 3 - 4 + 5 - 6 + 7 \cdots + 99 - 100$

- a. 50
- b. 55
- c. -50
- d. -55
- e. -150

23. The ratio of three to five is the same as the ratio of

- a. five to three
- b. five to eight
- c. five to ten
- d. six to eight
- e. six to ten

24. Examine this argument

Line 1: Suppose $x^2 - 2x + 1 = x - 1$

Line 2: Then $(x-1)^2 = x - 1$

Line 3: So $x - 1 = 1$

Line 4: So $x = 2$

Line 5: Checking, $2^2 - 2 \cdot 2 + 1 = 1 = 2 - 1$

Does this argument have an error?

- a. The argument has no errors.
- b. Yes, the first error is in Line 2.
- c. Yes, the first error is in Line 3.
- d. Yes, the first error is in Line 4.
- e. Yes, the first error is in Line 5.

25. What is the LCM of $4ab$ and $6bc^2$?

- a. $2ab$
- b. $2b$
- c. $12abc^2$
- d. $12ab^2c^2$
- e. b

26. Kim's Fruit Market prices fruit by the piece and not by weight. A small bag of three apples and two pears costs \$1.85. A large bag of seven apples and five pears costs \$4.45. Which of the following statements must be true?

- a. An apple and a pear are the same price.
- b. A pear is 5 cents more than an apple.
- c. A pear is 10 cents more than an apple.
- d. An apple is 5 cents more than a pear.
- e. An apple is 10 cents more than a pear.


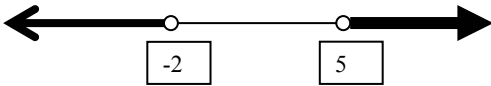
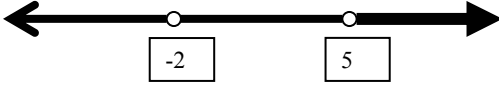

27. Compare $\sqrt{m+n}$ and $\sqrt{m} + \sqrt{n}$, where m and n are known to be positive numbers between 10 and 99, but their actual values are unknown. Which of the following statements must be true?
- $\sqrt{m+n}$ and $\sqrt{m} + \sqrt{n}$ are always equal
 - $\sqrt{m+n}$ is always larger than $\sqrt{m} + \sqrt{n}$
 - $\sqrt{m+n}$ is always smaller than $\sqrt{m} + \sqrt{n}$
 - $\sqrt{m+n}$ is usually larger than $\sqrt{m} + \sqrt{n}$
 - $\sqrt{m+n}$ is usually smaller than $\sqrt{m} + \sqrt{n}$
28. Solve the equation $q = 11 - 4p$ for p .
- $p = 4q + 11$
 - $p = 4q - 11$
 - $p = (q + 11)/4$
 - $p = (11 - q)/4$
 - none of these
29. Solve the inequalities $-6 < 2x + 4 \leq 0$ for x . How many integers are in the solution set?
- 3
 - 4
 - 6
 - 7
 - more than 7
30. You are selling tickets to a concert priced at \$5 for adults and \$2 for students. At the end of the day, you have sold 10 tickets and you report that you have taken in \$40. However, you may have made a \$1 error, and so your correct total may have been \$39 or \$40 or \$41. Can the number of student tickets sold be determined?
- No.
 - Yes, 3 were sold.
 - Yes, 4 were sold.
 - Yes, 5 were sold.
 - Yes, none were sold.
31. Find the two solutions to the quadratic equation $x^2 - x = 2$. What is the larger of the two solutions?
- 2
 - 1
 - 0
 - 1
 - none of these

32. Solve the quadratic equation $2x^2 + 7x + 5 = 0$. What is the sum of the two solutions?
- -7
 - $-\frac{3}{2}$
 - $-\frac{7}{2}$
 - 3
 - $\frac{7}{2}$
33. Solve the equation $\sqrt{x+4} = x$. Which of the following statements describes the solution set?
- There is one solution; it is a rational number.
 - There are two solutions; they are rational numbers.
 - There is one solution; it is an irrational number.
 - There are two solutions; they are irrational numbers.
 - There is no solution.
34. Any line perpendicular to the line $x + y = 2$ must have which of the following attributes?
- It passes through the origin.
 - It has a slope of 1
 - It has a slope of -1
 - It has a slope of $1/2$
 - It has a slope of $-1/2$
35. What can you say about the intersection of lines $4x - y = 7$ and $x + 3y = 5$?
- They intersect at a point (x, y) ; both x and y are positive.
 - They intersect at a point (x, y) ; both x and y are negative.
 - They intersect at a point (x, y) ; x is positive and y is negative.
 - They intersect at a point (x, y) ; x is negative and y is positive.
 - The lines do not intersect.
36. At how many points do the curves $y = x$ and $y = x^{2003}$ intersect?
- three
 - two
 - one
 - zero
 - more than three

37. Factor completely $18x^4 - 32x^2$.

- a. $2(3x^2 - 4x)(3x^2 + 4x)$
- b. $2x^2(9x^2 - 16)$
- c. $2x^2(3x - 4)^2$
- d. $2x^2(3x + 4)(3x - 4)$
- e. none of the above

38. Which of the following graph represents all real solutions of $|2x - 3| > 7$?

- a. 
- b. 
- c. 
- d. 
- e. none of the above

39. Which of the following expression is equivalent to $\left(\frac{2 \cdot x^{-2} \cdot y^3}{z^{-1}}\right)^{-3}$?

- a. $\frac{8 \cdot x^6 \cdot y^{-3}}{z^3}$
- b. $\frac{x^6 \cdot z^3}{8 \cdot y^9}$
- c. $\frac{8 \cdot x^6}{z^3 \cdot y^6}$
- d. $\frac{x^6}{8 \cdot y^9 \cdot z^3}$
- e. $\frac{8 \cdot z^3 \cdot y^9}{x^6}$

40. Simplify the following expression $2(x - 3y) - \frac{1}{2}(4x - 6y) - (3x + y)$.

- a. $-3x - 4y$
- b. $-3x - 8y$
- c. $-3x - 10y$
- d. $3x - 4y$
- e. $3x - 8y$