

Numbers, Numbers Sense, and Computation

1. The equation below illustrates a property of real numbers.

$$2(10 + 20) + 30 = 2(20 + 10) + 30$$

Which property is illustrated by the equation?

- A. associative property
 - B. commutative property
 - C. distributive property
 - D. identity property
2. The equation below illustrates a property of real numbers.

$$9 + 0 = 0 + 9 = 9$$

Which property is illustrated by the equation?

- A. additive identity property
 - B. additive inverse property
 - C. associative property
 - D. distributive property
3. The equation below illustrates a property of real numbers.

$$17(1) = 1(17) = 17$$

What is the property?

- A. associative property of multiplication
 - B. distributive property
 - C. multiplicative identity property
 - D. multiplicative inverse property
4. What property is demonstrated by $(3 + 10x) + 4x = 3 + (10x + 4x)$?
- A. associative
 - B. commutative
 - C. distributive
 - D. identity

5. Sally says she never has to use subtraction when solving linear equations. Which property of real numbers is Sally using in place of subtraction?

- A. commutative property of addition
- B. associative property of addition
- C. additive identity property
- D. additive inverse property

6. Which one of the following statements is NOT always true for positive numbers a , b , and c ?

- A. $a(b \cdot c) = (a \cdot b)c$
- B. $a(b + c) = a \cdot b + a \cdot c$
- C. $a \div (b \cdot c) = (b \cdot c) \div a$
- D. $a + (b + c) = a + (c + b)$

7. Which expression shows how the distributive property can be used to calculate the cost of 6 jars of peanut butter costing \$3.98 per jar?

- A. $3(3.00) + 3(0.98)$
- B. $3(4.00) - 3(0.02)$
- C. $6(3.00) - 6(0.98)$
- D. $6(4.00) - 6(0.02)$

8. Which value is between 6 and 7?

- A. $\sqrt{29}$
- B. $\sqrt{36}$
- C. $\sqrt{39}$
- D. $\sqrt{50}$

9. The square root of k is between 7 and 8. Which statement about k is true?

- A. $0 < k < 5$
- B. $10 < k < 20$
- C. $25 < k < 35$
- D. $45 < k < 65$

10. Which is the **best** approximation of $\sqrt[3]{65}$?

- A. 4.0
- B. 4.5
- C. 8.0
- D. 8.5

11. What is the value of $\sqrt{400} + \sqrt[3]{1000}$?

- A. 30
- B. 50
- C. 140
- D. 300

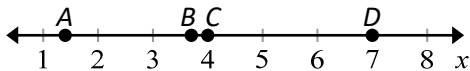
12. Use the numbers below.

$$\sqrt[3]{8} \quad 3^3 \quad \sqrt{26} \quad 25 \quad 2\sqrt{5}$$

Which list is ordered from least to greatest?

- A. $3^3 \quad 2\sqrt{5} \quad \sqrt[3]{8} \quad \sqrt{26} \quad 25$
- B. $\sqrt[3]{8} \quad \sqrt{26} \quad 2\sqrt{5} \quad 25 \quad 3^3$
- C. $3^3 \quad 25 \quad \sqrt{26} \quad 2\sqrt{5} \quad \sqrt[3]{8}$
- D. $\sqrt[3]{8} \quad 2\sqrt{5} \quad \sqrt{26} \quad 25 \quad 3^3$

13. Which point best represents the value of $\sqrt{14}$?



- A. Point A
- B. Point B
- C. Point C
- D. Point D

14. The value of $\sqrt{3} + \sqrt{5}$ is closest to which integer?

- A. 2
- B. 4
- C. 8
- D. 15

15. Which expression is closest to 18?

- A. $3^2 + 2^3$
- B. $\sqrt{80} + \sqrt{80}$
- C. $2\sqrt[3]{1000}$
- D. 9^2

16. Five numbers are shown below.

$$30 \quad 50 \quad \sqrt{30} \quad \sqrt{50} \quad 7^2$$

Which is a true statement about the numbers?

- A. $50 - \sqrt{30} < 7^2$
- B. $50 + \sqrt{30} < 7^2$
- C. $\sqrt{50} - 30 > 7^2$
- D. $\sqrt{50} + 30 > 7^2$

17. Which statement is true if $x = 10^0 + \sqrt[3]{30}$?

- A. $0 < x \leq 4$
- B. $4 < x \leq 6$
- C. $6 < x \leq 12$
- D. $12 < x \leq 20$

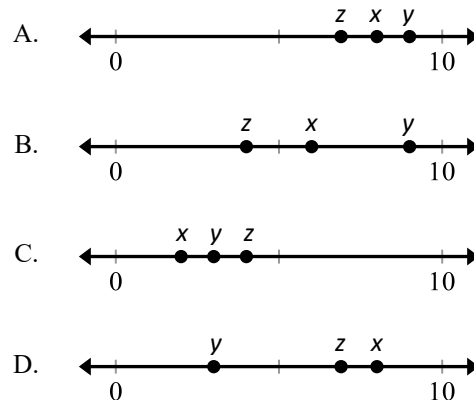
18. Three expressions are shown below.

$$\sqrt{n} \quad n \quad n^2$$

Which expression is correct when $0 < n < 1$?

- A. $\sqrt{n} < n < n^2$
- B. $n^2 < n < \sqrt{n}$
- C. $n < \sqrt{n} < n^2$
- D. $n < n^2 < \sqrt{n}$

19. Given $x = 2^3$, $y = \sqrt[3]{27}$, and $z = 4\sqrt{3}$, which number line shows the correct placement of x , y and z ?



20. An expression is shown below.

$$\left(\frac{x \cdot y}{3}\right)^2$$

What is the value of the expression when $x = \sqrt{9^2}$ and $y = \sqrt[3]{64}$?

- A. 12
- B. 64
- C. 144
- D. 432

21. What is the value of $\frac{3^2 \cdot 2^3}{2^2 \cdot 2^1}$?

- A. 9
- B. $\frac{9}{2}$
- C. $\frac{9}{4}$
- D. $\frac{27}{2}$

22. Look at the equation below.

$$x + 4 = y$$

Which expression is equal to $2x + 8$?

- A. $y + 4$
- B. $y + 8$
- C. $2y$
- D. $2y + 4$

23. Add.

$$\begin{bmatrix} -4 & 2 \\ 3 & -1 \end{bmatrix} + \begin{bmatrix} 5 & 0 \\ -2 & 1 \end{bmatrix}$$

- A. $\begin{bmatrix} -20 & 0 \\ -6 & -1 \end{bmatrix}$
- B. $\begin{bmatrix} 1 & 2 \\ -1 & -1 \end{bmatrix}$
- C. $\begin{bmatrix} 1 & 2 \\ 1 & 0 \end{bmatrix}$
- D. $\begin{bmatrix} 1 & 2 \\ 3 & -1 \end{bmatrix}$

24. Subtract.

$$\begin{bmatrix} 2 & -4 \\ 3 & 0 \end{bmatrix} - \begin{bmatrix} 0 & 2 \\ -3 & -5 \end{bmatrix}$$

- A. $\begin{bmatrix} 0 & -8 \\ -9 & 0 \end{bmatrix}$
- B. $\begin{bmatrix} 2 & -2 \\ 0 & -5 \end{bmatrix}$
- C. $\begin{bmatrix} 2 & -6 \\ 6 & 5 \end{bmatrix}$
- D. $\begin{bmatrix} 2 & 2 \\ 0 & 5 \end{bmatrix}$

25. Multiply.

$$3 \begin{bmatrix} 5 & -2 \\ -1 & 0 \end{bmatrix}$$

- A. $\begin{bmatrix} 15 & -6 \\ -3 & 0 \end{bmatrix}$
- B. $\begin{bmatrix} 15 & -2 \\ -3 & 0 \end{bmatrix}$
- C. $\begin{bmatrix} 15 & -6 \\ -1 & 0 \end{bmatrix}$
- D. $\begin{bmatrix} 15 & 6 \\ 3 & 0 \end{bmatrix}$

26. Use the matrices below.

$$K = \begin{bmatrix} 4 & 0 \\ -1 & 3 \end{bmatrix} \quad L = \begin{bmatrix} 3 & -1 \\ 0 & 4 \end{bmatrix} \quad M = \begin{bmatrix} -3 & 1 \\ 0 & -4 \end{bmatrix}$$

Which sum is equal to $\begin{bmatrix} 6 & -2 \\ 0 & 8 \end{bmatrix}$?

- A. $K + M$
- B. $L + L$
- C. $L + M$
- D. $M + M$

27. The table below shows favorite foods of students in three different classes.

	Burritos	Hamburgers	Pizza
Class 1	6	9	10
Class 2	7	9	13
Class 3	11	10	9

Which matrix represents the total number of students who favor burritos, hamburgers, and pizzas?

- A. $[25 \ 29 \ 30]$
B. $[32 \ 28 \ 24]$
C. $[10 \ 13 \ 9]$
D. $[24 \ 28 \ 32]$
28. The tables below show favorite foods of three classes from two teachers.

Favorite Foods – Teacher A

	Burritos	Hamburgers	Pizza
Period 1	10	11	12
Period 2	9	13	10
Period 3	7	8	9

Favorite Foods – Teacher B

	Burritos	Hamburgers	Pizza
Period 1	10	15	8
Period 2	7	14	9
Period 3	8	12	7

Which matrix shows that Period 2 likes hamburgers the most?

- A. $[7 \ 14 \ 9]$
B. $[9 \ 13 \ 10]$
C. $[16 \ 27 \ 19]$
D. $[25 \ 41 \ 24]$