Algebra 1 Midterm 2019

Question 1 .

A polynomial expression is shown below.

$$(4x^4 + 3x^2 - 1) + (mx^3 + 2)(3x^2 + 1)$$

The expression is simplified to $15x^5 + 4x^4 + 5x^3 + 9x^2 + 1$.

What is the value of m?

- **A.** $^-3$
- **B.** 3
- **C.** 5
- **D.** 15

Question 2 .

An expression is shown below.

$$\sqrt{91x}$$

For which value of x should the expression be further simplified?

- **A.** $x = 6$
- **B.** $x = 10$
- **C.** $x = 14$
- **D.** $x = 17$

Question 3 .

Simplify:

$$\frac{^-2x^3 - 8x^2 - 6x}{^-2x^3 + 10x^2 + 12x}; \ x \neq {}^-1, 0, 6$$

- **A.** $\dfrac{x + 3}{x - 6}$

- **B.** $\dfrac{^-4}{5}x^2 - \dfrac{1}{2}x$

- **C.** $x^3 - \dfrac{4}{5}x^2 - \dfrac{1}{2}x$

- **D.** $\dfrac{x - 3}{x + 6}$

Question 4 .

Order the following list of numbers from least to greatest.

$$\sqrt{79}\ ,\ 8.\overline{7}\ ,\ \frac{26}{3}\ ,\ 8.8\overline{3}$$

○ **A.** $\frac{26}{3}\ ,\ 8.8\overline{3}\ ,\ 8.\overline{7}\ ,\ \sqrt{79}$

○ **B.** $8.\overline{7}\ ,\ \frac{26}{3}\ ,\ \sqrt{79}\ ,\ 8.8\overline{3}$

○ **C.** $\frac{26}{3}\ ,\ 8.\overline{7}\ ,\ 8.8\overline{3}\ ,\ \sqrt{79}$

○ **D.** $\sqrt{79}\ ,\ 8.\overline{7}\ ,\ 8.8\overline{3}\ ,\ \frac{26}{3}$

Question 5 .

When factored completely, which is a factor of $3x^3 - 9x^2 - 12x$?

○ **A.** $(x - 3)$
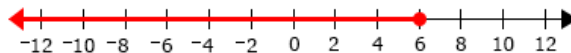
○ **B.** $(x - 4)$

○ **C.** $(3x - 1)$

○ **D.** $(3x - 4)$

Question 6 .

Simplify: $6\sqrt{63} - 6\sqrt{28}$

○ **A.** $12\sqrt{7}$

○ **B.** $6\sqrt{7}$

○ **C.** $30\sqrt{7}$

○ **D.** $17\sqrt{5}$

Question 7 .

The solution set of an inequality is shown below.

Which inequality has the solution set shown on the number line?

○ **A.** $\frac{^-x}{8} \le \frac{^-3}{4}$

○ **B.** $\frac{x}{8} \le \frac{^-3}{4}$

○ **C.** $\frac{x}{8} \le \frac{3}{4}$

○ **D.** $\frac{^-x}{8} \le \frac{3}{4}$

Question 8 .

Harvey is solving an equation. His work is shown below.

$$5x + (5x + 9) = 57$$
$$(5x + 5x) + 9 = 57$$
$$10x + 9 = 57$$

Which statement describes the procedure Harvey used in his work and which property justifies the procedure?

- **A.** Harvey regrouped the terms to multiply $5x$ and $5x$ by 9. This procedure is justified by the associative property.

- **B.** Harvey regrouped the terms to add $5x$ and $5x$. This procedure is justified by the associative property.

- **C.** Harvey regrouped the terms to add $5x$ and $5x$ and 9. This procedure is justified by the commutative property.

- **D.** Harvey regrouped the terms to multiply $5x$ and $5x$. This procedure is justified by the commutative property.

Question 9 .

The least common multiple (LCM) of $3x^3y^kz^4$ and $5x^2y^3z^k$ is $15x^3y^4z^4$. What is the value of k?

- **A.** 1
- **B.** 2
- **C.** 3
- **D.** 4

Question 10 .

Solve for x.

$$7x + 2 = 4x - 5x + 8$$

- **A.** $x = \dfrac{5}{4}$

- **B.** $x = \dfrac{3}{4}$

- **C.** $x = -5$

- **D.** $x = -3$

Question 11 .

Simplify the following expression.

$$(2x + 4)(x - 3)$$

A. $2x^2 + 2x - 12$

B. $2x^2 - 10x - 7$

C. $2x^2 - 2x - 12$

D. $2x^2 - 10x - 12$

Question 12 .

$$6x^4y^4 \qquad 66x^4y^2$$

What is the greatest common factor (GCF) of the monomials shown above?

A. $6x^4y^4$

B. $66x^8y^6$

C. $66x^4y^4$

D. $6x^4y^2$

Question 13 .

Simplify.

$$\sqrt{847}$$

A. $77\sqrt{11}$

B. $7\sqrt{11}$

C. $11\sqrt{7}$

D. $121\sqrt{7}$

Question 14 .

Simplify the following expression.

$$\frac{x^2 + 4x - 21}{(x + 7)(x + 1)}$$

- A. 1

- B. $\frac{x - 3}{x + 7}$

- C. $\frac{x + 7}{x + 1}$

- D. $\frac{x - 3}{x + 1}$

Question 15 .

A company prices its tank-style water heaters at $1,505 per unit and its tankless water heaters at $2,990 per unit. Last week, the company sold 152 tank-style water heaters and 46 tankless water heaters. What is the **closest estimate** of the total sales revenue the company generated by selling both types of water heaters last week?

- A. $250,000

- B. $375,000

- C. $525,000

- D. $675,000

Question 16 .

Olivia purchased x child tickets and y adult tickets at the movies. She spent a total of $46. The equation below describes the relationship between the number of child tickets and the number of adult tickets purchased.

$$7x + 9y = 46$$

The ordered pair (4, 2) is the solution to the equation. What does the solution (4, 2) represent?

- A. Olivia spent $4 on child tickets and $2 on adult tickets.

- B. Child tickets cost $4 each and adult tickets cost $2 each.

- C. Olivia purchased 2 child tickets and 4 adult tickets.

- D. Olivia purchased 4 child tickets and 2 adult tickets.

Question 17 .

Simplify: $|{}^-84 + 9 \times 6| - (\sqrt{16})^3$

- A. ${}^-94$
- B. ${}^-34$
- C.   74
- D.   386

Question 18 .

Simplify the expression given below.

$$(8x^3 - 2) - (6x^2 + 3x - 7)$$

- A. $2x^3 - 3x + 5$
- B. $8x^3 - 6x^2 - 3x + 5$
- C. $8x^3 - 5x^2 - 2x + 5$
- D. $8x^3 + 6x^2 + 3x + 9$

Question 19 .

Four expressions are shown below.

$$5\sqrt{x} \qquad 5x^2 \qquad \frac{5}{2x} \qquad \frac{x}{5}$$

Which inequality comparing two of the expressions is true when $0.2 \le x \le 0.6$?

- A. $\frac{x}{5} > \frac{5}{2x}$
- B. $\frac{x}{5} > 5x^2$
- C. $5\sqrt{x} > \frac{5}{2x}$
- D. $5\sqrt{x} > 5x^2$

Question 20 .

Mohammad makes and sells jewelry. His monthly goal is to make a profit over $2,500.

- He sells each piece of jewelry for $25.
- He has a monthly fixed cost of $1,725.

The inequality $25x + 1{,}725 > 2{,}500$ models this situation. Which **best** describes the meaning of x in the inequality?

- A.   the number of pieces of jewelry that Mohammad must sell to recover his monthly fixed costs
- B.   the profit made from selling 25 pieces of jewelry
- C.   the profit made from 1 month of sales
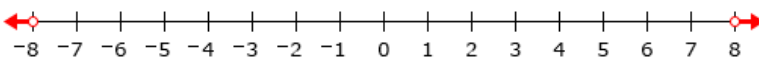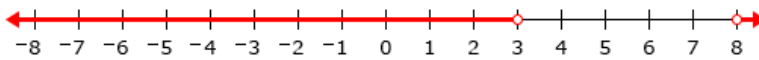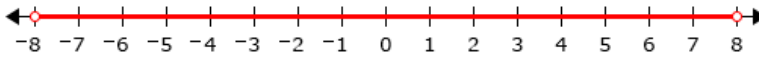- D.   the number of pieces of jewelry Mohammad must sell to reach his goal
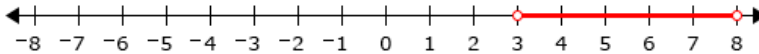
Question 21 .

Factor the polynomial below.

$$x^2 + 7x + 6$$

A. $(x - 1)(x - 6)$

B. $(x - 1)(x + 6)$

C. $(x + 1)(x - 6)$

D. $(x + 1)(x + 6)$

Question 22 .

Which graph shows the solution set of the inequality $|4x - 22| > 10$?

A.

B.

C.

D.

Question 23 .

Evaluate the following expression for $z = 226$.

$$11 + 9\sqrt{z - 1}$$

A. 137

B. 146

C. 300

D. 155

Answers

1. C
2. C
3. A
4. C
5. B
6. B
7. C
8. B
9. D
10. B
11. C
12. D
13. C
14. D
15. B
16. D
17. B
18. B
19. D
20. D
21. D
22. B
23. B