

Algebra 1 Midterm 2019 version 3

Question 1 .

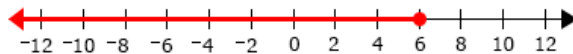
Simplify:

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

- ☐ A. $\frac{-4}{5}x^2 - \frac{1}{2}x$
- ☐ B. $x^3 - \frac{4}{5}x^2 - \frac{1}{2}x$
- ☐ C. $\frac{x+3}{x-6}$
- ☐ D. $\frac{x-3}{x+6}$

Question 2 .

The solution set of an inequality is shown below.



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

- ☐ A. $\frac{15}{8} \leq \frac{-3}{4}$
- ☐ B. $\frac{15}{8} \leq \frac{3}{4}$
- ☐ C. $\frac{-15}{8} \leq \frac{3}{4}$
- ☐ D. $\frac{-15}{8} \leq \frac{-3}{4}$

Question 3 .

Four expressions are shown below.

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

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

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

Question 4 .

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 5 .

Order the following list of numbers from least to greatest.

$$\sqrt{24}, 4.\bar{7}, \frac{14}{3}, 4.8\bar{3}$$

- ☐ A. $4.\bar{7}, \frac{14}{3}, \sqrt{24}, 4.8\bar{3}$
- ☐ B. $\frac{14}{3}, 4.8\bar{3}, 4.\bar{7}, \sqrt{24}$
- ☐ C. $\sqrt{24}, 4.\bar{7}, 4.8\bar{3}, \frac{14}{3}$
- ☐ D. $\frac{14}{3}, 4.\bar{7}, 4.8\bar{3}, \sqrt{24}$

Question 6 .

$$49x^2y \quad 35x^3y^3$$

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

- ☐ A. $7x^3y^3$
- ☐ B. $245x^3y^3$
- ☐ C. $7x^2y$
- ☐ D. $245x^5y^4$

Question 7 .

Simplify the expression given below.

$$(9x^3 - 2) - (6x^2 + 6x - 7)$$

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

Question 8 .

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 9 .

Factor the polynomial below.

$$x^2 + 6x + 8$$

- ☐ A. $(x + 2)(x - 4)$
- ☐ B. $(x - 2)(x - 4)$
- ☐ C. $(x - 2)(x + 4)$
- ☐ D. $(x + 2)(x + 4)$

Question 10 .

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 $5x$. This procedure is justified by the commutative property.
- ☐ B. Harvey regrouped the terms to add $5x$ and $5x$ and 9 . This procedure is justified by the commutative property.
- ☐ C. Harvey regrouped the terms to multiply $5x$ and $5x$ by 9 . This procedure is justified by the associative property.
- ☐ D. Harvey regrouped the terms to add $5x$ and $5x$. This procedure is justified by the associative property.

Question 11 .

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. Child tickets cost \$4 each and adult tickets cost \$2 each.
- ☐ B. Olivia spent \$4 on child tickets and \$2 on adult tickets.
- ☐ C. Olivia purchased 2 child tickets and 4 adult tickets.
- ☐ D. Olivia purchased 4 child tickets and 2 adult tickets.

Question 12 .

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 13 .

Simplify the following expression.

$$(3x + 4)(x - 7)$$

- ☐ A. $3x^2 - 25x - 28$
- ☐ B. $3x^2 - 25x - 11$
- ☐ C. $3x^2 - 17x - 11$
- ☐ D. $3x^2 - 17x - 28$

Question 14 .

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 15 .

Evaluate the following expression for $z = 19$.

$$10 + 9\sqrt{z - 1}$$

- ☐ A. 127
- ☐ B. 266
- ☐ C. 145
- ☐ D. 136

Question 16 .

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

Question 17 .

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 18 .

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

- ☐ A. -94
- ☐ B. -34
- ☐ C. 74
- ☐ D. 386

Question 19 .

Simplify: $6\sqrt{63} - 3\sqrt{28}$

- ☐ A. $9\sqrt{7}$
- ☐ B. $42\sqrt{7}$
- ☐ C. $24\sqrt{7}$
- ☐ D. $12\sqrt{7}$

Question 20 .

Solve for x.

$$7x + 6 = 4x - 5x + 24$$

- ☐ A. $x = -9$
- ☐ B. $x = \frac{15}{4}$
- ☐ C. $x = \frac{9}{4}$
- ☐ D. $x = -15$

Question 21 .

Simplify.

$$\sqrt{847}$$

- ☐ A. $11\sqrt{7}$
- ☐ B. $77\sqrt{11}$
- ☐ C. $121\sqrt{7}$
- ☐ D. $7\sqrt{11}$

Question 22 .

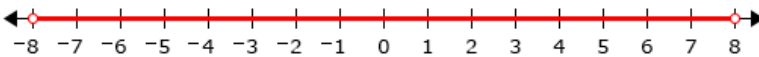
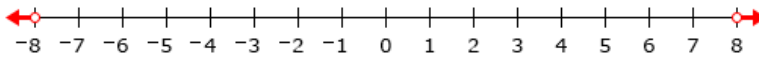
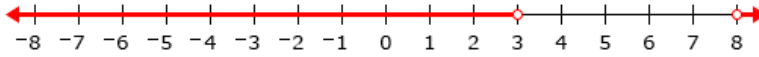
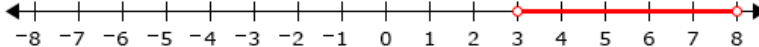
Simplify the following expression.

$$\frac{x^2 + 9x - 36}{(x + 12)(x + 2)}$$

- ☐ A. $\frac{x - 3}{x + 3}$
- ☐ B. $\frac{x - 3}{x + 2}$
- ☐ C. $\frac{x + 12}{x + 2}$
- ☐ D. 1

Question 23 .

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

- ☐ A. 
- ☐ B. 
- ☐ C. 
- ☐ D. 

Answers

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