

Directions: Please choose the best answer choice for each of the following questions.

1. Simplify.

$$\sqrt{25x^2y} \cdot \sqrt{32y^4x}$$

- A. $20xy^2\sqrt{2xy}$
- B. $20y^2x^2\sqrt{2y}$
- C. $5xy \cdot 4y^2\sqrt{2x}$
- D. $5x^2\sqrt{y} \cdot 4y^4\sqrt{2x}$

Answer Choice Rationale

- A. Correct
- B. No rationale available
- C. No rationale available
- D. No rationale available

ItemID A2K.1090180
 Correct A
 Standard(s) MA.9-12.MA.912.A.6.2

2. What is $\sqrt{28} + \sqrt{63}$ in simplest form?

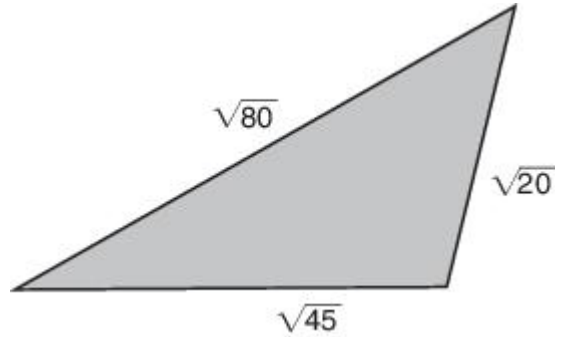
- A. $2\sqrt{7} + 3\sqrt{7}$
- B. $4\sqrt{7} + 9\sqrt{7}$
- C. $13\sqrt{7}$
- D. $5\sqrt{7}$

Answer Choice Rationale

- A. No rationale available
- B. No rationale available
- C. No rationale available
- D. Correct

ItemID A2KC.1086869
 Correct D
 Standard(s) MA.9-12.MA.912.A.6.2

3. For a classroom exercise, Mrs. Patrick presented this figure and asked four of her students to find its exact perimeter.



Which student response is correct?

- A. $\sqrt{145}$ units
- B. $9\sqrt{5}$ units
- C. $29\sqrt{5}$ units
- D. $24\sqrt{15}$ units

Answer Choice Rationale

- A. $\sqrt{80} + \sqrt{20} + \sqrt{45}$ does not have the same value as $\sqrt{80 + 20 + 45}$.
- B. Correct answer
- C. $\sqrt{16 \cdot 5} + \sqrt{4 \cdot 5} + \sqrt{4 \cdot 5}$ does not have the same value as $(16 + 4 + 9)\sqrt{5}$.
- D. $\sqrt{16 \cdot 5} + \sqrt{4 \cdot 5} + \sqrt{4 \cdot 5}$ does not have the same value as $(16 + 4 + 9 - 5)\sqrt{5 + 5 + 5}$.

ItemID A2K.1046310
 Correct B
 Standard(s) MA.9-12.MA.912.A.6.2

4. Mrs. Robbins asked her students to simplify this expression.

$$\sqrt{27} - \sqrt{300} + \sqrt{243}$$

Which student response is correct?

- A. $-10\sqrt{3}$
- B. $-4\sqrt{3}$
- C. $2\sqrt{3}$
- D. $4\sqrt{3}$

Answer Choice Rationale

- A. This answer is found by subtracting and adding the square roots without first converting them to the same square root, and then incorrectly simplifying $-\sqrt{30}$.
- B. This answer correctly simplifies the square roots, but subtracts $3\sqrt{3}$ instead of adding $3\sqrt{3}$.
- C. Correct answer.
- D. This answer correctly simplifies the square roots, but adds $10\sqrt{3}$ instead of subtracting $10\sqrt{3}$ and subtracts $9\sqrt{3}$ instead of adding $9\sqrt{3}$.

ItemID A2K.1042654
 Correct C
 Standard(s) MA.9-12.MA.912.A.6.2

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

$$\sqrt{81} \div (-\sqrt{9}) \times \sqrt{144} \div \sqrt{196} \times (-\sqrt{25}) \div \sqrt{225}$$

- A. $\frac{6}{7}$
- B. $\frac{36}{49}$
- C. $\frac{36}{49}$
- D. $\frac{6}{7}$

Answer Choice Rationale

- A. The order of operations were done correctly, but the product of 2 negative numbers is positive.
- B. This is the result of squaring the correct answer, then multiplying by -1 .
- C. This is the result of squaring the correct answer.

D. Correct answer

ItemID A2K.1042510
 Correct D
 Standard(s) MA.9-12.MA.912.A.6.2

6.
$$\frac{3x^3 - x^2 + 5x}{x} =$$

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

Answer Choice Rationale

- A. Correct
- B. No rationale available
- C. No rationale available
- D. No rationale available

ItemID A2KC.1087218
 Correct A
 Standard(s) MA.9-12.MA.912.A.4.4

7.
$$\frac{4x^3 + x^2}{x^2} =$$

- A. $4x^3$
- B. $4x^3 + 1$
- C. $2x$
- D. $4x + 1$

Answer Choice Rationale

- A. No rationale available
- B. No rationale available
- C. No rationale available
- D. Correct

ItemID A2KC.1087220
 Correct D
 Standard(s) MA.9-12.MA.912.A.4.4

8. What is the answer to the division problem $\frac{3x^2}{y^3} \div \frac{x}{y}$?

- A. $\frac{y^2}{3x}$
- B. $\frac{y^4}{3x^3}$
- C. $\frac{3x}{y^2}$
- D. $\frac{3x^3}{y^4}$

Answer Choice Rationale

- A. This answer subtracts the exponents and then finds the inverse of the answer.
- B. This answer adds the exponents and then finds the inverse of the answer.
- C. Correct answer.
- D. This answer adds the exponents instead of subtracting the exponents.

ItemID A2K.1020597
 Correct C
 Standard(s) MA.9-12.MA.912.A.4.4

9. Simplify.

$$\frac{2x^5y^2 + 10x^4y^3}{xy^2}$$

- A. $12x^4y^3$
- B. $12x^8y^3$
- C. $2x^3(x + 5y)$
- D. $2x^4(1 + 5y^3)$

Answer Choice Rationale

- A. This answer adds the terms in the numerator to give $12x^9y^5$ and then divides the numerator by the denominator. This answer also makes a calculation error when dividing the numerator by the denominator.

- B. This answer adds the terms in the numerator to give $12x^9y^5$ and then divides the numerator by the denominator. This answer does not recognize that the terms cannot be added because they are not like terms.
- C. Correct answer.
- D. This answer factors the terms in the numerator correctly and eliminates the common factor xy^2 , but makes an error when factoring $2x^4 + 10x^3y$.

ItemID A2K.1021458
 Correct C
 Standard(s) MA.9-12.MA.912.A.4.4

10. Find the quotient.

$$\frac{40x^3y - 8x^2y^3 - 32xy^2}{8xy}$$

- A. $5x^2 - xy^2 - 4y$
- B. $5x^2y - xy^2 - 4xy$
- C. $32x^2 - 16xy^2 - 40y$
- D. $32x^2y - 16xy^2 - 40xy$

Answer Choice Rationale

- A. Correct answer.
- B. The student did not understand that a variable divided by itself is 1, meaning it cancels completely. The student understood to divide the coefficients and had a good understanding of the rule for dividing with exponents.
- C. The student understands the rule for dividing exponents. However, the student applied that rule for the coefficients, instead of dividing the numbers.
- D. The student applied the rule for exponents to the coefficients, meaning that the student subtracted the coefficients instead of dividing them.

ItemID A2K.1221770
 Correct A
 Standard(s) MA.9-12.MA.912.A.4.4

Stop! You have finished this exam.