

Part I: Multiple Choice. Write the correct answer in the space provided at the end of this section.

1. What is the simplest form of $\sqrt[3]{54x^5y^6z^8}$?

(A) $2xy^2z^2\sqrt[3]{3x^2z^2}$

(B) $3x^2y^3z^4\sqrt[3]{6x}$

(C) $3xy^3z^2\sqrt[3]{2x^2z^2}$

(D) $3xy^2z^2\sqrt[3]{2x^2z^2}$

2. Simplify completely: $\frac{2}{7}\sqrt{98} - \frac{3}{2}\sqrt{8} + \frac{4}{5}\sqrt{50}$

(A) $3\sqrt{2}$

(B) $5\sqrt{2}$

(C) $9\sqrt{2}$

(D) $28\sqrt{2}$

3. Simplify completely: $\frac{6\sqrt{12x^{16}}}{2\sqrt{18x^9}}$

(A) $x\sqrt{16}$

(B) $x^3\sqrt{6x}$

(C) $\frac{3}{2}x^3\sqrt{3x}$

(D) $\frac{3}{2}x^3\sqrt{6x}$

4. An incorrect simplification is provided. In which step does the **first** error occur?

Simplify: $\frac{\sqrt{3}+\sqrt{5}}{\sqrt{3}-\sqrt{5}}$

Solution: Step 1: $\frac{\sqrt{3}+\sqrt{5}}{\sqrt{3}-\sqrt{5}} \cdot \frac{\sqrt{3}+\sqrt{5}}{\sqrt{3}+\sqrt{5}}$

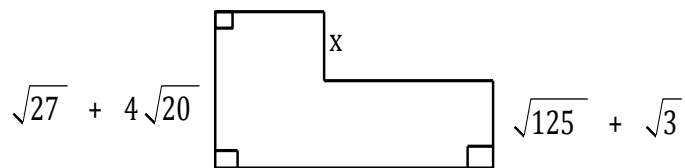
Step 2: $\frac{\sqrt{9}+\sqrt{25}}{\sqrt{9}-\sqrt{25}}$

Step 3: $\frac{3+5}{3-5}$

Step 4: 4

- (A) 1
- (B) 2
- (C) 3
- (D) 4

5. Determine a simplified expression for the value of x :



- (A) $2\sqrt{3} + \sqrt{5}$
- (B) $2\sqrt{3} + 3\sqrt{5}$
- (C) $4\sqrt{3} + \sqrt{5}$
- (D) $4\sqrt{3} + 3\sqrt{5}$

6. Write $4x^3y^2\sqrt{5xy}$ as an entire radical.

(A) $\sqrt{20x^7y^5}$

(B) $\sqrt{20x^{10}y^5}$

(C) $\sqrt{80x^7y^5}$

(D) $\sqrt{80x^{10}y^5}$

7. Simplify completely: $\frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}$

(A) $3\sqrt{2} - 2\sqrt{3}$

(B) $3\sqrt{2} + 2\sqrt{3}$

(C) $\frac{3\sqrt{2} - 2\sqrt{3}}{5}$

(D) $\frac{3\sqrt{2} + 2\sqrt{3}}{5}$

8. Simplify completely: $\frac{\sqrt[3]{2}}{\sqrt[3]{6}}$

(A) $\frac{\sqrt[3]{3}}{3}$

(B) $\frac{\sqrt[3]{9}}{3}$

(C) $\frac{\sqrt[3]{12}}{6}$

(D) $\frac{\sqrt[3]{72}}{6}$

9. What are the restrictions on x of the solution to the equation $\sqrt{-8 - 2x} = 7$?
- (A) $x \leq -4$
 - (B) $x \geq -4$
 - (C) $x \leq 4$
 - (D) $x \geq 4$
10. Solve: $\sqrt{5x} = 6$
- (A) $x = \frac{6}{5}$
 - (B) $x = \frac{6}{\sqrt{5}}$
 - (C) $x = \frac{36}{25}$
 - (D) $x = \frac{36}{5}$
11. Solve $\sqrt{7x - 5} = \sqrt{x - 6}$
- (A) $x = -\frac{11}{6}$
 - (B) $x = -\frac{11}{8}$
 - (C) $x = -\frac{1}{6}$
 - (D) $x = -\frac{1}{8}$
12. Solve $\sqrt{2x + 1} = -5$
- (A) $x = -3$
 - (B) $x = 2$
 - (C) $x = 12$
 - (D) no solution

Answers to multiple choice.

1.____ 2.____ 3.____ 4.____ 5.____

6.____ 7.____ 8.____ 9.____ 10.____

11.____ 12.____

Part II: Constructed Response. Answer each question in the space provided.

13. Rationalize the denominator and simplify: $\frac{\sqrt{6}}{4-\sqrt{2x}}$

14. State restrictions on the variable and solve. Be sure to check for extraneous roots:

$$n - \sqrt{3 - n} = -9$$

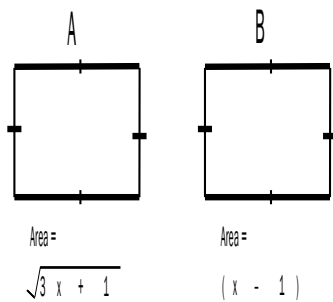
15. State restrictions on the variable and solve. Be sure to check for extraneous roots:

$$\frac{1}{2}m - \sqrt{13 - m} = -1$$

16. State restrictions on the variable and solve. Be sure to check for extraneous roots:

$$\sqrt{m + 19} + \sqrt{m - 2} = 7$$

17. The areas of congruent squares A and B are represented by $\sqrt{3x + 1}$ square units and $(x - 1)$ square units, respectively. Algebraically determine the area of each square.



18. The formula $s = 2\pi\sqrt{\frac{l}{32}}$ represents the swing of a pendulum, where s is the time, in seconds, to swing back and forth, and l is the length of the pendulum, in feet.

(A) Solve the formula for l .

(B) What is the length of a pendulum that makes one swing in 1.5 s?