

1. Verify each of the following equations and determine which is/are true. (*Lesson 1*)

I. $(-3)^2 = -3^2$

II. $(-3)^3 = -3^3$

III. $(-3)^0 = -1$

A. I. only

B. II. only

C. III. only

D. I., II., and III.

E. None of the above

2. Simplify: (*Lesson 2*)

$$\left(\frac{-64x^3}{y^6z^8}\right)^{-\frac{2}{3}}$$

A. $\frac{y^4z^2 \cdot \sqrt[3]{z^2}}{-16x^2}$

B. $\frac{y^4 \cdot \sqrt[8]{z^3}}{-16x^2}$

C. $\frac{y^4z^2 \cdot \sqrt[3]{z^2}}{16x^2}$

D. $\frac{y^4 \cdot \sqrt[8]{z^3}}{16x^2}$

E. None of the above

3. Verify each of the following equations and determine which is/are true. (*Lesson 4*)

I. $(4x^3 + 5x - 3) - (3x^3 + 2x^2 + 5x - 7) = x^3 - 2x^2 + 4$

II. $(4x - 5)(2x^2 + 3x - 7) = 8x^3 + 2x^2 - 43x + 35$

III. $(a^3 - a^2)^2 = a^6 - a^4$

A. I. and II. only

B. I. and III. only

C. II. and III. only

D. All three equations are true

E. None of the above

4. Factor each of the following polynomials, and determine which has a factor of $x + 2$. (*Lesson 4*)

A. $x^2 + 4$

B. $x^4 - 16$

C. $x^2 + 10x - 24$

D. There is more than one possible answer

E. None of the above

5. Simplify completely. You may need to use one of the following formulas: (*Lesson 5*)

$$x^3 - y^3 = (x - y)(x^2 + xy + y^2)$$

$$x^3 + y^3 = (x + y)(x^2 - xy + y^2)$$

$$\frac{r^3 - 64}{r^2 - 16}$$

A. $r - 4$

B. $r + 4$

C. $r^2 + 16$

D. $\frac{r^2 - 4r + 16}{r - 4}$

E. $\frac{r^2 + 4r + 16}{r + 4}$

6. Simplify completely. (*Lesson 6*)

$$\frac{\frac{x}{y^2} - \frac{y}{x^2}}{\frac{1}{x^2} - \frac{1}{y^2}}$$

A. $-\frac{x^2 + xy + y^2}{x + y}$

B. $\frac{x^2 + xy + y^2}{x + y}$

C. $-x + xy + y$

D. $-x - xy - y$

E. $x + xy + y$

7. Rationalize the denominator of the following expression. (*Lesson 6*)

$$\frac{3 + \sqrt{x}}{3 - \sqrt{x}}$$

- A. $6x$
- B. $6\sqrt{x}$
- C. $\frac{x^2+6x+9}{9-x}$
- D. $\frac{x+6\sqrt{x}+9}{9-x}$
- E. None of the above

8. Solve the equation: (*Lesson 7*)

$$\frac{7}{x-2} + \frac{6}{x^2-4} = \frac{3}{2x+4}$$

- A. There is one solution for x . It is less than 0.
- B. There is one solution for x . It is between 0 and 10.
- C. There is one solution for x . It is greater than 10.
- D. There is no solution for x .
- E. None of the above

9. Solve $V = C \left(1 - \frac{T}{N}\right)$ for N . (*Lesson 7*)

- A. $N = \frac{V+CT}{C}$
- B. $N = \frac{C-CT}{V}$
- C. $N = \frac{CT}{C-V}$
- D. $N = \frac{T}{1-V}$
- E. $N = \frac{T}{-V}$

10. Solve for x . (*Lesson 10*)

$$\frac{1}{x-4} = x - 4$$

- A. There are two solutions.
Both are positive.
- B. There are two solutions.
Both are negative.
- C. There are two solutions.
One is positive and one is negative.
- D. There are no solutions.
- E. None of the above.

11. Solve for x . (*Lesson 11*)

$$(x+3)(x+1) = 1$$

- A. $x = -4 \pm \sqrt{2}$
- B. $x = -2 \pm \sqrt{2}$
- C. $x = -2 \pm 2\sqrt{2}$
- D. $x = 2(1 \pm \sqrt{1})$
- E. None of the above

12. Solve for x and choose the answer that best describes the solution(s). (*Lesson 14*)

$$x = 4 + \sqrt{4x - 19}$$

- A. There is one solution.
It is negative.
- B. There is one solution.
It is positive.
- C. There are two solutions.
Both are positive.
- D. There are two solutions.
One is positive and one is negative.
- E. There is no solution for x .

13. A woman has \$216,000 to invest and wants to generate \$12,000 per year in interest income. She can invest in two tax-free funds. The first is stable, but pays only an average 4.5% interest per year. The second pays an average of 9.25% interest per year, but has greater risk. If x represents the amount of money invested in the fund that averages 9.25% interest per year, which of the following best describes the value of x ? (*Lesson 8*)
- A. x is less than \$50,000
 - B. x is between \$50,000 and \$60,000
 - C. x is between \$60,000 and \$70,000
 - D. x is between \$70,000 and \$80,000
 - E. x is more than \$80,000
14. A man can clear his driveway using a snowblower in 30 minutes. It takes his son 1.5 hours to clear the driveway using a shovel. About how long would it take them to clear the driveway if they worked together? (*Lesson 9*)
- A. Less than 5 minutes
 - B. Between 5 and 15 minutes
 - C. Between 15 and 25 minutes
 - D. Between 25 and 35 minutes
 - E. More than 35 minutes
15. Two trains leave a station at 11:00am. One train travels north at a rate of 75 mph and another travels east at a rate of 60 mph. Assuming the trains do not stop, about how many minutes will it take for the trains to be 150 miles apart? (*Lesson 12*)
- A. Less than 60 minutes
 - B. Between 60 and 70 minutes
 - C. Between 70 and 80 minutes
 - D. Between 80 and 90 minutes
 - E. More than 90 minutes