

1. If  $x < 0$  and  $y > 0$ , determine which of the following inequalities is/are true. (*Lesson 1*)

I.  $|x|y^3 > 0$   
II.  $\frac{y-x}{xy} < 0$   
III.  $y|x - y| < 0$

- A. I and II only  
B. I and III only  
C. II and III only  
D. I, II, and III  
E. None of the answer choices above

2. Simplify: (*Lesson 2*)

$$\frac{(3x^2y^{-3})^{-2}}{x^{-5}y}$$

- A.  $-6xy^5$   
B.  $\frac{1}{9x^7y^4}$   
C.  $\frac{1}{9x^{14}y^4}$   
D.  $\frac{xy^5}{6}$   
E.  $\frac{xy^5}{9}$

3. Simplify: (*Lesson 3*)

$$(\sqrt{x} - \sqrt{y})^2 - (\sqrt{x} + \sqrt{y})^2$$

- A.  $-2y$   
B.  $-4\sqrt{xy}$   
C.  $0$   
D.  $2y$   
E. None of the above

4. Which of the following is a factor of the polynomial  $10x^2 - 13x + 3$ . (*Lesson 4*)

A.  $5x - 1$   
B.  $2x - 3$   
C.  $10x - 3$   
D.  $x + 1$   
E. More than one of the above

5. Perform the indicated operations and simplify: (*Lesson 5*)

$$\frac{x}{x+1} + \frac{1}{x-1}$$

A.  $\frac{1}{x-1}$   
B.  $-1$   
C.  $\frac{x+1}{x-1}$   
D.  $\frac{x^2+1}{x^2-1}$   
E.  $\frac{x}{x-1}$

6. Simplify; do not include negative exponents in your final answer: (*Lesson 6*)

$$\frac{(x+y)^{-1}}{xy^{-1}}$$

A.  $\frac{xy}{x+y}$   
B.  $y + x$   
C.  $\frac{y}{x(x+y)}$   
D.  $\frac{1}{2}$   
E.  $\frac{1}{x(x+1)}$

7. 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

8. Solve the equation: (*Lesson 10*)

$$(x-4)^2 - 14 = 0$$

- A. There are two solutions for  $x$ .  
One is positive and one is negative.
- B. There are two solutions for  $x$ .  
Both are positive.
- C. There are two solutions for  $x$ .  
Both are negative.
- D. There is one solution for  $x$ .  
It is positive.
- E. There is one solution for  $x$ .  
It is negative.

9. Solve the formula  $x^2 + y^2 = r^2$  for  $x$ . (*Lesson 11*)

- A.  $x = \pm\sqrt{y^2 - r^2}$
- B.  $x = \pm(r - y)$
- C.  $x = \pm\sqrt{r^2 - y^2}$
- D.  $x = \pm(y + r)$
- E. None of the above

10. Solve the equation: (*Lessons 11, 13*)

$$x^3 - 3x^2 + 10x = 0$$

- A. There are two solutions.  
Both are real.
- B. There are two solutions.  
Both are imaginary.
- C. There are three solutions.  
All are real.
- D. There are three solutions.  
One is real and two are imaginary.
- E. There are three solutions.  
One is imaginary and two are real.

11. Solve the equation: (*Lessons 13, 14*)

$$x^4 + 10x^2 - 24 = 0$$

- A.  $x = \pm 2i, \pm \sqrt{6}$
- B.  $x = \pm \sqrt{2} i, \pm 2\sqrt{3}$
- C.  $x = \pm 2, \pm \sqrt{6} i$
- D.  $x = \pm \sqrt{2}, \pm 2\sqrt{3} i$
- E.  $x = \pm 2, \pm \sqrt{6}$

12. Which of the following statements is/are true? (*Lesson 14, 15*)

- I.  $|x| = -2$ , when  $x = -2, 2$
- II.  $|x| > 2$ , when  $-2 < x < 2$
- III.  $|x| < 0$  for all real numbers

- A. I only
- B. II only
- C. III only
- D. All are true
- E. None are true

13. A large solar heating panel requires 120-gallons of a fluid that is 30% antifreeze. The fluid comes in either a 50% solution or a 20% solution. How many gallons of the 50% solution should be used?

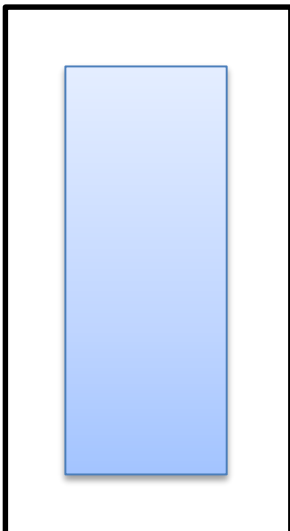
(Lesson 8)

- A. Less than 30 gallons
- B. Between 30 and 45 gallons
- C. Between 45 and 60 gallons
- D. Between 60 and 75 gallons
- E. More than 75 gallons

14. A man can clear his driveway using a snowblower in 45 minutes. It takes his son 2 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 10 minutes
- B. Between 10 and 20 minutes
- C. Between 20 and 30 minutes
- D. Between 30 and 40 minutes
- E. More than 40 minutes

15. The length of a rectangular pool is to be four times its width, and a sidewalk 6 feet wide will surround the pool. If a total area of  $1440 \text{ ft}^2$  has been set aside for construction, what are the dimensions of the pool? (Lesson 12)



- A.  $6 \text{ ft} \times 24 \text{ ft}$
- B.  $8 \text{ ft} \times 32 \text{ ft}$
- C.  $10 \text{ ft} \times 40 \text{ ft}$
- D.  $12 \text{ ft} \times 48 \text{ ft}$
- E. None of the above