

1. Divide and simplify.

$$(x - 3) \div \frac{x^2 + 3x - 18}{x^2}$$

- a)  $\frac{x - 3}{3x - 18}$
- b)  $\frac{x^2}{x + 6}$
- c)  $(x - 3)^2(x + 6)$
- d)  $\frac{x + 6}{x}$

2. Perform the indicated operations.

$$\frac{x - 1}{x - 2} - \frac{x + 1}{x + 2} + \frac{x - 6}{x^2 - 4}$$

- a)  $\frac{x - 6}{(x^2 - 4)}$
- b)  $\frac{x - 10}{x^2 - 4}$
- c)  $\frac{3x - 8}{x^2 - 4}$
- d)  $\frac{3}{x + 2}$

3. Simplify.

$$\frac{a}{b + \frac{2}{a}}$$

- a)  $\frac{a^2}{ab + 2}$
- b)  $\frac{a}{ab + 2b}$
- c)  $\frac{1}{ab + 2}$
- d)  $\frac{a^2}{b + 2}$

4. Which of the following represents a line that passes through the points (4, 13) and (4, 11)?

- a)  $y = 2x + 9$
- b)  $y = 2x + 5$
- c)  $x = 4$
- d)  $y = 4$

5. Amy can do a job in 5 hours, while it takes Mark 4 hours and Julie 6 hours each to do the same job alone. How long would it take them to do the job if the three of them worked together?

- a) 2 hours
- b) 3 hours
- c)  $\frac{30}{37}$  hours
- d)  $\frac{60}{37}$  hours

6. A car rental company charges a flat fee of \$20 and an hourly charge of \$12. Determine how long the car was rented if the bill came to \$140.

- a) 4.375 hours
- b) 6.6 hours
- c) 10 hours
- d) 8 hours

7. Simplify. Assume  $x > 0$ .

$$\left(\frac{16x^2y^4}{81}\right)^{3/4}$$

- a)  $\frac{8xy^3}{9}$
- b)  $\frac{8xy^3\sqrt{x}}{27}$
- c)  $\frac{2xy^3}{3}$
- d)  $\frac{16xy\sqrt{x}}{9}$

8. Write as a single fraction with positive exponents.

$$\left(\frac{x}{y}\right)^{-3} + \left(\frac{2y}{x}\right)^{-2}$$

- a)  $\frac{4y^2 + x^2}{4}$
- b)  $\frac{4y^5 + x^5}{x^2y^3}$
- c)  $\frac{2y^5 + x^5}{x^3y^2}$
- d)  $\frac{4y^5 + x^5}{4x^3y^2}$

9. A right triangle has hypotenuse of length 8 and one side of length 14. Find the solution set.  
 6. Find the length of the other side.

$$x^2 - 8x \geq -12$$

- |                |                                    |
|----------------|------------------------------------|
| a) 10          | a) $[6, \infty)$                   |
| b) $2\sqrt{7}$ | b) $[2, 6]$                        |
| c) 2           | c) $(-\infty, 3] \cup [4, \infty)$ |
| d) 14          | d) $(-\infty, 2] \cup [6, \infty)$ |

10. Find the solution set for  $x$ .

$$\sqrt{2x+9} - 5 = x$$

- a)  $\{-4\}$   
 b)  $\{2\}$   
 c)  $\{-8, 2\}$   
 d)  $\emptyset$

15. Solve for  $y$ .

$$|-3y + 2| = |7y - 5|$$

- a)  $y = \frac{7}{10}$  only  
 b)  $y = \frac{7}{10}, y = \frac{3}{4}$   
 c)  $y = \frac{7}{10}, y = -\frac{3}{4}$   
 d)  $y = -\frac{3}{4}$  only

11. Simplify.

$$\sqrt{72} + \sqrt{200} + \sqrt{75} + \sqrt{12}$$

- a)  $23\sqrt{3}$   
 b)  $23\sqrt{6}$   
 c)  $13\sqrt{3} + 10\sqrt{2}$   
 d)  $16\sqrt{2} + 7\sqrt{3}$

16. At a movie theater, a child's ticket costs \$5 and an adult's ticket costs \$9. Yesterday, 100 tickets were sold for a total of \$600. How many adult tickets were sold?

- a) 25  
 b) 20  
 c) 28  
 d) 32

12. Multiply.

$$(3\sqrt{5} + \sqrt{2})(3\sqrt{5} - \sqrt{2})$$

- a)  $13 - 6\sqrt{10}$   
 b)  $43 + 6\sqrt{10}$   
 c) 43  
 d) 13

17. Which of the following is an equation for the line perpendicular to the line  $y = 3x + 1$  and through the point  $(6, 2)$ ?

- a)  $y = -\frac{1}{3}x$   
 b)  $y = \frac{1}{3}x$   
 c)  $y = -\frac{1}{3}x + 4$   
 d)  $y = 3x - 16$

13. Write in standard  $a + bi$  form.

$$\frac{2 + 5i}{-2 + 3i}$$

- a)  $-\frac{4}{5} - \frac{31}{5}i$   
 b)  $\frac{11}{13} - \frac{16}{13}i$   
 c)  $\frac{11}{5} - \frac{16}{5}i$   
 d)  $-\frac{4}{13} - \frac{15}{13}i$

18. Simplify.

$$(3i + 6)(2i - 5)$$

- a)  $2i + 48$   
 b)  $-3i - 36$   
 c)  $-3i - 48$   
 d)  $-3i - 24$

19. Solve for  $x$ .

$$x(x + 2) = 7$$

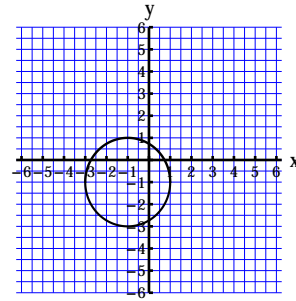
- a)  $x = -1 \pm 2\sqrt{2}$
- b)  $x = \frac{-2 \pm 5\sqrt{2}}{2}$
- c)  $x = -1 \pm i\sqrt{6}$
- d)  $x = -1 \pm \sqrt{6}$

20. Find an equation of the circle whose diameter has endpoints  $(2, 1)$  and  $(6, 5)$ .

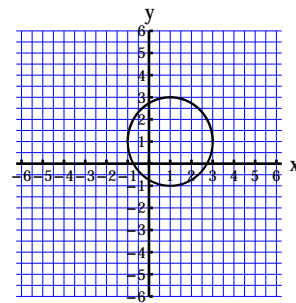
- a)  $x^2 + y^2 - 8x - 6y - 7 = 0$
- b)  $x^2 + y^2 - 6x - 8y + 17 = 0$
- c)  $x^2 + y^2 - 6x - 8y + 15 = 0$
- d)  $x^2 + y^2 - 8x - 6y + 17 = 0$

21. Identify the graph of  $x^2 + y^2 + 2x + 2y - 2 = 0$ .

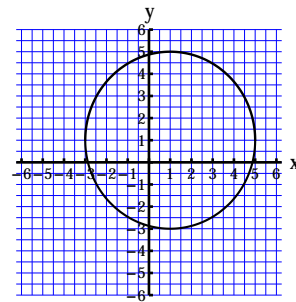
a)



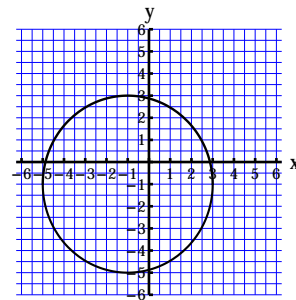
b)



c)

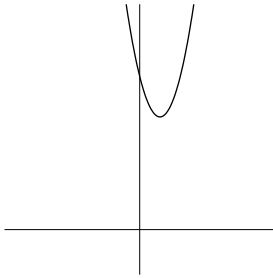


d)

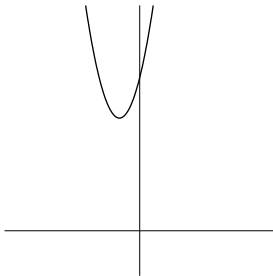


22. Identify the graph of  $y = -x^2 - 4x + 5$ .

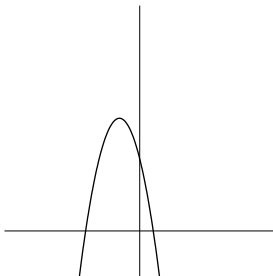
a)



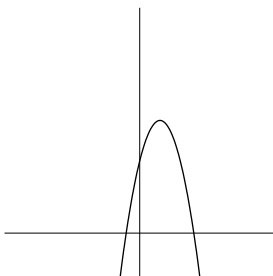
b)



c)



d)



23. The sum of three numbers is 65. The first number is five less than the second. The third is twice the first. What is the first number?

a) 5

b) 15

c) 7

d) 10

24. Ryan and Phil are buying ice-cream and hot fudge for a party. Ryan buys two gallons of ice-cream and three quarts of hot fudge, spending \$36. Phil buys two gallons of ice-cream and two quarts of hot fudge, spending \$32. How much does a gallon of ice-cream cost?

a) 4

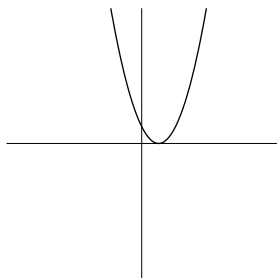
b) 14

c) 16

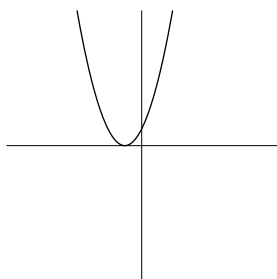
d) 12

25. Identify the graph of  $y = (x - 1)^2$ .

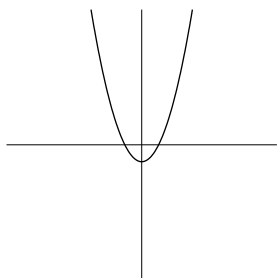
a)



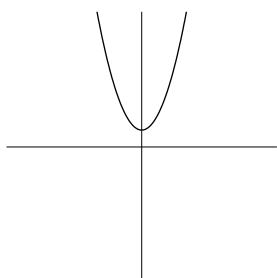
b)



c)



d)



FINAL- SAMPLE A - KEY

1. B 2. D 3. A 4. C 5. D 6. C 7. B 8. D 9. B 10. A 11. D 12. C  
 13. B 14. D 15. B 16. A 17. C 18. B 19. A 20. D 21. A 22. C 23.  
 B 24. D 25. A