

1. Simplify  $\frac{-30x^2z^2}{-35xz^3}$ .

a)  $\frac{6xz}{7}$

b)  $\frac{6x}{7z}$

c)  $\frac{-7x}{6z}$

d)  $\frac{-6x}{7z}$

2. Perform the indicated operation  $\frac{9y^2}{x^2 + 12x + 36} \div \frac{12y}{x^2 + 6x}$ .

a)  $\frac{108y^3}{x(x+6)^3}$

b)  $\frac{3xy}{4(x+6)}$

c)  $\frac{3xy^2}{(x+6)}$

d)  $\frac{3(x+6)}{4xy}$

3. Simplify the complex fraction  $\frac{\frac{1}{x} + \frac{1}{y}}{2}$ .

a)  $\frac{x+y}{2}$

b)  $x+y$

c)  $2x+2y$

d)  $\frac{x+y}{2xy}$

4. Simplify  $\frac{9}{x^2 - x} - \frac{2}{x}$ .

a)  $\frac{7x - 2x^2}{x - 1}$

b)  $7 - 2x$

c)  $\frac{11 - 2x}{x(x-1)}$

d)  $11 - 2x$

5. Solve  $\frac{5y-4}{6y^2+y-12} - \frac{2}{2y+3} = \frac{5}{3y-4}$ .

a)  $\{27\}$

b)  $\left\{-\frac{27}{11}\right\}$

c)  $\left\{-\frac{15}{11}\right\}$

d)  $\{-1\}$

6. Solve for  $N$  in terms of  $V, C,$  and  $T$ :

$$V = C \left(1 - \frac{T}{N}\right).$$

a)  $N = \frac{V}{C} - T$

b)  $N = \frac{CT}{C-V}$

c)  $N = \frac{CT}{V-C}$

d)  $N = T - \frac{V}{C}$

7. Simplify  $\left(\frac{6x^{-2}}{2x^4}\right)^{-2}$ .

a)  $3x^{12}$

b)  $3$

c)  $\frac{1}{9x^4}$

d)  $\frac{x^{12}}{9}$

8. Express  $x^{-2} - y^{-3}$  as a single fraction with positive exponents.

a)  $\frac{1}{x^2y^3}$

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

c)  $\frac{2}{x^2y^3}$

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

9. Simplify  $\frac{3\sqrt{7}}{2\sqrt{18}}$ .

a)  $\frac{\sqrt{14}}{4}$

b)  $\frac{\sqrt{7}}{6}$

c)  $\frac{3\sqrt{7}}{12}$

d)  $\frac{\sqrt{14}}{36}$

10. Simplify  $\sqrt{24x^5y^4}$ .

a)  $4x^2y^2\sqrt{6}$

b)  $12x^2y^2\sqrt{x}$

c)  $2x^2y^2\sqrt{6x}$

d)  $4x^2y^2\sqrt{3x}$

11. Find the product and simplify  $(\sqrt{2x} + \sqrt{3y})(\sqrt{2x} - \sqrt{3y})$

- a)  $4x^2 - 9y^2$
- b)  $4x^2 + 9y^2$
- c)  $2x - 3y$
- d)  $2x + 3y$

12. How many solutions does the equation  $\sqrt{y} + 6 = y$  have?

- a) 0
- b) 1 only
- c) 2
- d) There are an infinite number of solutions.

13. Evaluate  $-16^{\frac{3}{4}}$ .

- a)  $-8$
- b)  $64$
- c)  $8i$
- d)  $32i$

14. Write  $(3 - 7i)^2$  in standard form.

- a)  $9 + 7i$
- b)  $58 - 42i$
- c)  $-40 - 42i$
- d)  $9 - 91i$

15. Solve  $x(x + 8) = -23$ .

- a)  $\{-4 \pm i\sqrt{7}\}$
- b)  $\{0, -8\}$
- c)  $\{0, 8\}$
- d)  $\{-8 \pm i\sqrt{7}\}$

16. Find the sum of the roots of the quadratic equation  $6x^2 - 4x = 3$ .

- a)  $\frac{\sqrt{22}}{3}$
- b)  $\frac{2}{3}$
- c)  $\frac{1}{2}$
- d)  $4 + \frac{\sqrt{22}}{3}$

17. Solve  $n - \frac{2}{n} = -\frac{7}{3}$ .

- a)  $\{-3, \frac{2}{3}\}$
- b)  $\{-3\}$
- c)  $\{3, \frac{4}{3}\}$
- d)  $\{3\}$

18. Solve the inequality  $3x^2 + 14x - 5 > 0$ .

- a)  $(-\infty, -\frac{1}{3}) \cup (5, \infty)$
- b)  $(-\infty, -5) \cup (\frac{1}{3}, \infty)$
- c)  $(-5, \frac{1}{3})$
- d)  $(-\frac{1}{3}, 5)$

19. Solve the inequality  $\frac{x-1}{x+3} \leq 0$ .

- a)  $(-3, 1]$
- b)  $(-\infty, -3) \cup [1, \infty)$
- c)  $[-3, 1]$
- d)  $(-\infty, -3) \cup (1, \infty)$

20. The graph of  $y = (x - 3)^2 - 1$  is the basic parabola moved

- a) 3 units to the left and 1 unit down.
- b) 1 unit to the left and 3 units up.
- c) 3 units to the right and 1 unit down.
- d) 1 unit to the right and 3 units up.

21. Find the vertex of the parabola  $y = -2(x + 4)^2 + 3$ .

- a)  $(3, 4)$
- b)  $(-8, 3)$
- c)  $(-4, 3)$
- d)  $(4, 3)$

22. Write the equation of the circle with center  $(-4, 1)$  and radius 8.

- a)  $x^2 + y^2 + 8x - 2y - 47 = 0$
- b)  $x^2 + y^2 + 8x - 2y - 13 = 0$
- c)  $x^2 + y^2 + 4x - y - 13 = 0$
- d)  $x^2 + y^2 + 4x - y - 47 = 0$

23. Find the center and length of the radius of the circle  $x^2 + y^2 - 12x + 16y = 0$ .
- center  $(-6, 8)$ ; radius 10
  - center  $(6, -8)$ ; radius 6
  - center  $(6, -8)$ ; radius 8
  - center  $(6, -8)$ ; radius 10
24. Find the center of the ellipse  $4x^2 - 16x + y^2 + 6y + 9 = 0$ .
- $(4, -3)$
  - $(4, 3)$
  - $(2, -3)$
  - $(-2, 3)$
25. Find the coordinates of the endpoints of the major axis of the ellipse  $9x^2 + 4y^2 = 16$ .
- $(\frac{3}{4}, 0), (-\frac{3}{4}, 0)$
  - $(\frac{4}{3}, 0), (-\frac{4}{3}, 0)$
  - $(0, -2), (0, 2)$
  - $(0, -4), (0, 4)$
26. Find the equations for the asymptotes of the hyperbola  $x^2 - 9y^2 = 36$ .
- $y = \frac{1}{3}x$ ;  $y = -\frac{1}{3}x$
  - $y = 3x$ ;  $y = -3x$
  - $y = \frac{1}{3}x$ ;  $y = -\frac{1}{4}x$
  - $y = 4x$ ;  $y = -4x$
27. Find the intercepts for the graph of  $25x^2 - 16y^2 = 50$ .
- $(0, \frac{5\sqrt{2}}{4})$  and  $(0, -\frac{5\sqrt{2}}{4})$
  - $(\sqrt{2}, 0)$  and  $(-\sqrt{2}, 0)$
  - $(0, \frac{25}{8})$  and  $(0, -\frac{25}{8})$
  - $(\frac{5\sqrt{2}}{4}, 0)$  and  $(-\frac{5\sqrt{2}}{4}, 0)$
28. Solve the system  $\begin{cases} 3x - 7y = 2 \\ x + 4y = 1 \end{cases}$ .
- $(2, \frac{4}{7})$
  - $(\frac{15}{19}, \frac{1}{19})$
  - $(-7, 2)$
  - The system has no solution.
29. The cost of 3 apples and 2 oranges is \$7. The cost of 6 apples and 3 oranges is \$12. Find the cost of 1 orange.
- \$0.5
  - \$1.00
  - \$1.50
  - \$2.00
30. Solve the system  $\begin{cases} \frac{x-2}{4} + \frac{y+1}{3} = 2 \\ \frac{x+1}{7} + \frac{y-3}{2} = \frac{1}{2} \end{cases}$ .
- $(1, \frac{23}{4})$
  - $(2, 5)$
  - $(6, 2)$
  - The system has no solution.

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