

1. Find the domain of the rational function  $f(x) = \frac{-3x^2}{x^2 + 3x - 18}$

- a)  $\{x \mid x \neq 3, 6\}$
- b)  $\{x \mid x \neq -18, 1\}$
- c)  $\{x \mid x \neq -3, 6\}$
- d)  $\{x \mid x \neq 3, -6\}$

2. Simplify the rational expression  $\frac{x^2 - 49}{x^2 - x - 42}$

- a)  $\frac{x + 6}{x + 7}$
- b)  $\frac{x + 7}{x + 6}$
- c)  $\frac{7}{6}$
- d)  $\frac{x + 7}{x - 7}$

3. Multiply the rational expressions and simplify:  $\frac{4a^2}{a^2 - 4} \times \frac{4a - 8}{16a^2 + 16a}$

- a)  $\frac{1}{a + 3}$
- b)  $\frac{a^2 + 1}{a}$
- c)  $\frac{a}{a^2 + 3a + 2}$
- d)  $\frac{a}{a^2 + 2a + 1}$

4. Divide the rational expressions and simplify:  $\frac{2x^2 - 3x - 2}{x - 3} \div \frac{x^2 + x - 6}{x^2 + 4x - 21}$

- a)  $\frac{(2x + 1)(x - 2)^2(x + 3)}{(x - 3)^2(x + 7)}$
- b)  $\frac{(2x + 1)(x + 7)}{x + 3}$
- c)  $\frac{7}{3}$
- d)  $\frac{7(2x + 1)}{3}$

5. Perform the indicated operations and simplify.

$$\frac{2xy}{x^3} \times \frac{x^2y^3}{4y} \div \frac{y}{3xy^4}$$

- a)  $\frac{x^3y^5}{6x^4y^5}$
- b)  $\frac{3xy^6}{2}$
- c)  $\frac{24y^2}{x^3}$
- d)  $\frac{1}{6x}$

6. Perform the indicated operations and simplify.

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

- a)  $\frac{2}{x - y}$
- b)  $\frac{2}{x + y}$
- c)  $\frac{2}{(x - y)(x + y)}$
- d)  $\frac{2x - 8y}{(x - y)(x + y)}$

7. Perform the indicated operations.

$$\frac{x}{-x^2 + x + 2} + \frac{x}{x^2 - 2x}$$

- a)  $-\frac{x}{x - 2}$
- b)  $\frac{2x}{(x - 2)(x + 1)}$
- c)  $\frac{1}{(x - 2)(x + 1)}$
- d)  $\frac{2x + 1}{(x - 2)(x + 1)}$

8. Simplify  $\frac{\frac{2}{x+4} - 1}{\frac{x+2}{x+4}}$

- a) 1
- b) 2
- c) -1
- d) -2

9. Simplify  $6 + \frac{19}{x} + \frac{10}{x^2}$   
 $3 + \frac{x}{17} + \frac{10}{x^2}$

- a)  $\frac{x - 5}{3x + 5}$
- b)  $\frac{6x^2 + 19x + 10}{x - 5}$
- c)  $\frac{3x - 2}{2x - 5}$
- d)  $\frac{2x + 5}{x + 5}$

10. Solve the rational equation.  $\frac{5}{y} - \frac{6y+6}{2y} = -7$

- a)  $y = -\frac{1}{2}$
- b)  $y = \frac{11}{6}$
- c)  $y = \frac{1}{8}$
- d)  $y = -4$

11. Solve the rational equation.  $\frac{1}{x} + \frac{1}{x+5} = \frac{x+6}{x+5}$

- a)  $x = -5, x = 1$
- b)  $x = 5, x = 1$
- c)  $x = -5, x = -1$
- d)  $x = 1$

12. Simplify  $\sqrt[14]{(2x+3)^{14}}$

- a)  $(2x+3)^{14}$
- b)  $2x-3$
- c)  $|2x+3|$
- d)  $2x+14$

13. Simplify  $\sqrt{121z^4}$

- a)  $11z^2$
- b)  $22z$
- c)  $12z^2$
- d)  $12|z|$

14. What is the domain of the radical function  $f(x) = \sqrt{16-2x}$ ?

- a)  $[8, \infty)$
- b)  $[-8, \infty)$
- c)  $(-\infty, 8]$
- d)  $(-\infty, -8]$

15. What is the domain of the radical function  $f(x) = \sqrt[3]{16-2x}$ ?

- a)  $[8, \infty)$
- b)  $(-\infty, 8) \cup (8, \infty)$
- c)  $(-\infty, 8]$
- d)  $(-\infty, \infty)$

16. Simplify  $\left(\frac{64}{125}\right)^{-\frac{2}{3}}$

- a)  $\frac{16}{25}$
- b)  $-\frac{16}{25}$
- c)  $\frac{25}{16}$
- d)  $-\frac{25}{16}$

17. Simplify  $\sqrt[3]{x^6y^5}$ .

- a)  $x^3y\sqrt[3]{y^2}$
- b)  $x^2y\sqrt[3]{y^2}$
- c)  $x^2\sqrt[3]{y^5}$
- d)  $x^3y^2$

18. Add or subtract, if possible.

$$17\sqrt[3]{2} - 3\sqrt[3]{54}$$

- a)  $14\sqrt[3]{2}$
- b)  $17\sqrt[3]{2} - 3\sqrt[3]{54}$
- c)  $-8\sqrt[3]{2}$
- d)  $8\sqrt[3]{2}$

19. Multiply  $(2\sqrt{3x} + \sqrt{2})^2$

- a)  $12x + 4x\sqrt{6} + 2$
- b)  $36x + 2$
- c)  $12x + 4\sqrt{6x} + 2$
- d)  $3x + 2\sqrt{6x} + 1$

20. Rationalize the denominator of  $\frac{\sqrt[3]{3x}}{\sqrt[3]{5y}}$ .

- a)  $\frac{75x}{5y}$
- b)  $\frac{\sqrt[3]{75xy^2}}{5y}$
- c)  $\frac{\sqrt[3]{75xy}}{5y}$
- d)  $\frac{\sqrt[3]{375xy^2}}{5y}$

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