

Practice 12-3

Simplifying Rational Expressions

Simplify each expression.

1. $\frac{6x^4}{18x^2}$

2. $\frac{15a^2}{25a^4}$

3. $\frac{32h^3}{48h^2}$

4. $\frac{12n^4}{21n^6}$

5. $\frac{3x - 6}{6}$

6. $\frac{x^2 - 2x}{x}$

7. $\frac{4t^2 - 2t}{2t}$

8. $\frac{a^3 - 2a^2}{2a^2 - 4a}$

9. $\frac{21x^2y}{14xy^2}$

10. $\frac{32x^3y^2}{24xy^4}$

11. $\frac{x^2 + 3x}{3x + 9}$

12. $\frac{x^2 - 5x}{5x - 25}$

13. $\frac{x^2 + 13x + 12}{x^2 - 144}$

14. $\frac{x^2 - 9}{x^3 - 3x^2}$

15. $\frac{x^3 + x^2}{x + 1}$

16. $\frac{3x - 2y}{2y - 3x}$

17. $\frac{x^2 + x - 6}{x^2 - x - 2}$

18. $\frac{x^2 + 3x + 2}{x^3 + x^2}$

19. $\frac{2x^2 - 8}{x^2 - 3x + 2}$

20. $\frac{2x^2 - 5x + 3}{x^2 - 1}$

21. $\frac{3x + 3y}{x^2 + xy}$

22. $\frac{10 + 3x - x^2}{x^2 - 4x - 5}$

23. $\frac{9 - x^2}{x^2 + x - 12}$

24. $\frac{x^2 + 2x - 15}{x^2 - 7x + 12}$

25. $\frac{x^2 + 7x - 8}{x^2 + 6x - 7}$

26. $\frac{x^2 + 3x - 10}{25 - x^2}$

27. Write and simplify the ratio $\frac{\text{perimeter of rectangle}}{\text{area of rectangle}}$. The perimeter of the rectangle is $10w$ and the area of the rectangle is $4w^2$.

28. The ratio $\frac{3 \cdot \text{volume of cone}}{\text{area of base}}$ determines the height of a cone. Find the height when the volume is $4r^3 + 2r^2$ and the area of the base is $6r^2$.

29. The ratio $\frac{2 \cdot \text{area of triangle}}{\text{height of triangle}}$ determines the length of the base of a triangle. Find the length of the base when the area is $3n^2 + 6n$ and the height is $2n + 4$.

30. The ratio $\frac{\text{volume of rectangular solid}}{\text{area of rectangular base}}$ determines the height of a rectangular solid. Find the height when the volume is $5s^3 + 10s^2$ and the area is $5s^2$.