

ALGEBRAIC FRACTIONS

Simplifying Algebraic Fractions

For what value or values of x is the rational expression undefined?

1. $\frac{x-3}{2x+6}$

2. $\frac{-12}{5x-10}$

3. $\frac{x}{2x-8}$

4. $\frac{x-14}{3x-15}$

5. $\frac{x}{x^2+5x+6}$

6. $\frac{x-3}{x^2+3x-4}$

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

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

Simplify, if possible. If not possible, write NP.

9. $\frac{14k}{21}$

10. $-\frac{9}{33}x$

11. $\frac{42t}{70t}$

12. $-\frac{15x}{25x^3}$

13. $\frac{2x-10}{x-5}$

14. $\frac{a-6}{a^2-6a}$

15. $\frac{y^2-49}{y^2+4y-21}$

16. $\frac{2a+6}{3a-15}$

17. $\frac{a^2+3a-10}{2a^2+11a+5}$

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

19. $\frac{2y^2-y}{2y^2-5y-3}$

20. $\frac{m^2+4m}{m^2+m-12}$

21. $\frac{x^2-7x+18}{x^2-12x+27}$

22. $\frac{2a^2+7a-4}{a^2-16}$

23. $\frac{3m^2-9m-30}{6m-30}$

24. $\frac{5a-20}{a^2-4a}$

25. $\frac{t-3}{8.96t-26.88}$

26. $\frac{3m^2+21m-54}{0.341m-3.069}$

Evaluate for the given value of the variable.

27. $\frac{3a-5}{2a+1}$ for $a = -1$

28. $\frac{5x-3}{x^2-3}$ for $x = -2$

29. $\frac{m^2-9}{3m+5}$ for $m = 3$

Simplify, if possible.

30. $\frac{3a^4+7a^3-20a^2}{6a^4-7a^3-5a^2}$

31. $\frac{2p^3-14p^2+20p}{4p^4-8p^3-60p^2}$

32. $\frac{a^3+10a^2+25a}{a^5-3a^4-40a^3}$

33. $\frac{3y^3-15y^2-12y}{6y^3-42y^2}$

34. $\frac{3a^3-a^2-14a}{2a^4+3a^3-2a^2}$

35. $\frac{3x^2+18x-21}{15x^2-15}$

36. $\frac{2x^3-4x^2-6x}{4x^4-12x^3-16x^2}$

37. $\frac{3x^3+24x^2+48x}{9x^4-144x^2}$

38. $\frac{2a^2-ab-3b^2}{2a-3b}$

39. $\frac{a^3b^7(2x^2+9x-5)}{a^2b^9(2x^2+7x-15)}$

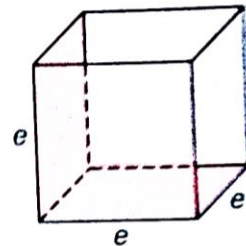
40. $\frac{a^3b^4(y^2+7y+10)}{a^6b^2(y^2+y-20)}$

41. $\frac{m^2n(2x^2-8x+6)}{mn^2(12x-36)}$

42. Write an explanation of how to determine the values of the variable for which a rational expression is undefined. Give an example of a rational expression that is always defined and an example of a rational expression that is undefined for certain values of the variable.

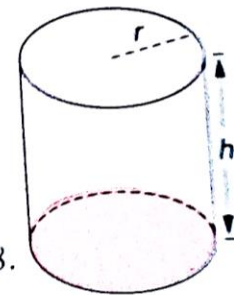
43. The area of a certain rectangle is represented by $x^2 + 2x - 3$ and its length by $x - 1$. Find its width.
44. The area of a certain rectangle is represented by $x^2 - 9$ and its width by $x - 3$. Find its length.

The volume of the cube at the right is determined by multiplying the area of its square base by its height. The total surface area of the cube is determined by multiplying the area of one face by 6.



45. Find an expression for the volume of the cube.
46. Find an expression for the total surface area of the cube.
47. Find the quotient of the total surface area divided by the volume.
48. Find the value of the quotient in Exercise 47 for $e = 4$.

The volume of the right circular cylinder at the right is $\pi r^2 h$ and its surface area is $2\pi r^2 + 2\pi rh$.



49. Find the quotient of the volume of the cylinder divided by its surface area.
50. Find the value of the quotient of Exercise 49 for $r = 3$ and $h = 8$.

Simplify.

51.
$$\frac{x^4 - 13x^2 + 36}{x^3 + x^2 - 6x}$$

54.
$$\frac{x^4 - 10x^2 + 9}{3x^2 - 27}$$

52.
$$\frac{9p^6 - 145p^4 + 16p^2}{3p^2 + 11p - 4}$$

55.
$$\frac{a^2 + 4ab - 21b^2}{a^2 + 7ab - 3a - 21b}$$

53.
$$\frac{50y^6 - 58y^4 + 8y^2}{30y^2 + 18y - 12}$$

56.
$$\frac{ax^2 - ay^2 + 3x^2 - 3y^2}{ax - ay + 3x - 3y}$$