

Simplifying Rational Expressions

Reduce each of the following to lowest terms:

1.
$$\frac{3x^3y}{x^2y^2} = \frac{3x}{y}$$

2.
$$\frac{4xy^2}{2x^3y^3} = \frac{2}{xy}$$

3.
$$\frac{x(x+2)}{x(x-2)} = \frac{(x+2)}{(x-2)}$$

4.
$$\frac{(x-1)(x+2)}{(2+x)} = (x-1)$$

5.
$$\frac{x^2 + x}{x+1} = \frac{x(x+1)}{(x+1)} = x$$

6.
$$\frac{x-1}{1-x} = \frac{-1(1-x)}{(1-x)} = -1$$

7.
$$\frac{3x^2}{6x^2 - 9x} = \frac{3x^2}{3x(2x-3)} = \frac{x}{(2x-3)}$$

8.
$$\frac{4x^2 - 2x^2}{2x^2} = \frac{2x^2}{2x^2} = 1$$

9.
$$\frac{t^2 + 2t}{t^2 + t - 2} = \frac{t(t+2)}{(t+2)(t-1)} = \frac{t}{(t-1)}$$

10.
$$\frac{x^3 - 4x}{x^3 - 4x^2 + 4x} = \frac{x(x-2)(x+2)}{x(x-2)(x-2)} = \frac{(x+2)}{(x-2)}$$

11.
$$\frac{a-x}{x-a} = \frac{-1(x-a)}{(x-a)} = -1$$

12.
$$\frac{t^2 - at}{t^2} = \frac{t(t-a)}{t^2} = \frac{(t-a)}{t}$$

13.
$$\frac{a^2 - t^2}{(a-t)^2} = \frac{(a-t)(a+t)}{(a-t)^2} = \frac{(a+t)}{(a-t)}$$

14.
$$\frac{(x+y)^2}{x^2 - y^2} = \frac{(x+y)^2}{(x-y)(x+y)} = \frac{(x+y)}{(x-y)}$$

15.
$$\frac{x^2 + x - 6}{(x-3)(x-2)} = \frac{(x+3)(x-2)}{(x-3)(x-2)} = \frac{(x+3)}{(x-3)}$$

16.
$$\frac{2x^2 - 5x + 2}{2x^2 - 3x - 2} = \frac{(2x-1)(x-2)}{(2x+1)(x-2)} = \frac{(2x-1)}{(2x+1)}$$

17.
$$\frac{4t^2 + 3t - 1}{4t^2 - 5t + 1} = \frac{(4t-1)(t+1)}{(4t-1)(t-1)} = \frac{(t+1)}{(t-1)}$$

18.
$$\frac{x^2 + 4x - 5}{x-1} = \frac{(x+5)(x-1)}{(x-1)} = (x+5)$$

19.
$$\frac{(x-1)(x+1)^2}{(x+1)(x-1)^2} = \frac{(x+1)}{(x-1)}$$

20.
$$\frac{x^4 - x^2}{x^4 - 1} = \frac{x^2(x-1)(x+1)}{(x^2+1)(x-1)(x+1)} = \frac{x^2}{(x^2+1)}$$

21.
$$\frac{x^4 - y^4}{(x+y)^2(x^2 + y^2)} = \frac{(x^2 + y^2)(x-y)(x+y)}{(x+y)^2(x^2 + y^2)} = \frac{(x-y)}{(x+y)}$$

22.
$$\frac{4x^2 + 2x - 2}{4x^2 - 1} = \frac{2(2x-1)(x+1)}{(2x-1)(2x+1)} = \frac{2(x+1)}{(2x+1)}$$

23.
$$\frac{3x^2 - x - 2}{6x^2 + x - 2} = \frac{(3x+2)(x-1)}{(3x+2)(2x-1)} = \frac{(x-1)}{(2x-1)}$$

24.
$$\frac{x^2 - x - 20}{x^2 - 25} = \frac{(x-5)(x+4)}{(x-5)(x+5)} = \frac{(x+4)}{(x+5)}$$