

1. Simplify: $\frac{15x^2y^2}{5xy^2}$
2. Simplify: $\frac{15x-3x^2}{25y-5xy}$
3. Simplify: $\frac{c-d}{d-c}$
4. State the domain, then simplify: $\frac{5x+35}{x+7}$
5. State the domain, then simplify: $\frac{x^2-8x+15}{x^2-x-6}$
6. State the domain, then simplify: $\frac{x^2-3(2x-3)}{9-x^2}$
7. State the domain, then simplify: $\frac{6x^2-13x+6}{3x^2+x-2}$
8. State the domain, then simplify: $\frac{3x^2-27}{x^2+3x-18}$
9. Simplify: $\frac{(x+1)^2}{x+1} \cdot \frac{x+2}{x+1}$
10. Simplify: $\frac{x^2+7xy+12y^2}{x^2+2xy-8y^2} \cdot \frac{x^2-xy-2y^2}{x^2+4xy+3y^2}$
11. Simplify: $\frac{2u^2+8u}{2u+8} \cdot \frac{4u^2+8uv+4v^2}{u^2+5uv+4v^2}$
12. Simplify: $\frac{5x^2+13x-6}{x+3} \div \frac{5x^2-17x+6}{x-2}$
13. Simplify: $\frac{x^2-y^2}{x^4-x^3} \div \frac{x-y}{x^2} \div \frac{x^2+2xy+y^2}{x+y}$
14. Simplify: $\frac{x-x^2}{x^2-4} \left(\frac{2x+4}{x+2} \div \frac{5}{x+2} \right)$
15. Find the LCD for the pair of fractions:
 $\frac{5}{x^2+2x+1}; \frac{8}{x+1}$
16. Find the LCD for the pair of fractions:
 $\frac{7}{x^2+6x+9}; \frac{5}{x+3}$
17. Supply the missing numerator:
 $\frac{2}{x+1} = \frac{?}{x^2+3x+2}$
18. Supply the missing numerator:
 $\frac{3}{x-1} = \frac{?}{x^2+x-2}$
19. Simplify: $\frac{21x}{14} - \frac{5x}{21}$
20. Simplify: $\frac{4x}{3} + \frac{2x}{y}$
21. Simplify: $\frac{3y-2}{y+3} - \frac{2y-5}{y+3}$
22. Simplify: $\frac{5x+8}{x+2} - \frac{3x-2}{x+2}$
23. Simplify: $\frac{x+1}{x-2} - \frac{2(x-3)}{x-2} + \frac{3(x+1)}{x-2}$
24. Simplify: $\frac{x^2-4}{x+2} + \frac{2(x^2-4)}{x+2} - \frac{3(x^2-5)}{x+2}$
25. Simplify: $\frac{x+5}{xy} - \frac{x-1}{x^2y}$
26. Simplify: $\frac{y-7}{y^2} - \frac{y+7}{2y}$
27. Simplify: $\frac{x}{(x-2)^2} + \frac{x-4}{x^2-4}$
28. Simplify: $\frac{a-2}{(a+3)^2} - \frac{a}{a-3}$
29. Simplify: $\frac{2x}{x^2-3x+2} + \frac{2x}{x-1} - \frac{x}{x-2}$
30. Simplify: $\frac{4x}{x-2} - \frac{3x}{x-3} + \frac{4x}{x^2-5x+6}$
31. Simplify: $\frac{\frac{1}{x}-3}{\frac{5}{x}+2}$
32. Simplify: $\frac{\frac{3}{x}-3}{\frac{9}{x}-3}$
33. Simplify: $\frac{\frac{1}{x+1}}{1+\frac{1}{x+1}}$
34. Simplify: $\frac{\frac{2}{x-2}}{\frac{2}{x-2}-1}$

35. Simplify: $\frac{\frac{5}{y-3} - \frac{2}{y}}{\frac{1}{y} + \frac{2}{y-3}}$
36. Simplify: $\frac{\frac{1}{y^2+y} - \frac{1}{xy+x}}{\frac{1}{xy+x} - \frac{1}{y^2+y}}$
37. Solve: $\frac{x}{2} + 4 = \frac{3x}{2}$
38. Solve: $\frac{5}{x} - \frac{4}{x} = 8 + \frac{1}{x}$
39. Solve: $\frac{1}{x-1} + \frac{3}{x-1} = 1$
40. Solve: $\frac{x^2}{x+2} - \frac{4}{x+2} = x$
41. Solve: $\frac{7}{q^2-q-2} + \frac{1}{q+1} = \frac{3}{q-2}$
42. Solve: $\frac{3x}{3x-6} + \frac{8}{x^2-4} = \frac{2x}{2x+4}$
43. Solve: $\frac{x-3}{x-2} = \frac{1}{x} + \frac{x-3}{x}$
44. Solve: $1 - \frac{3}{x} = \frac{-8x}{x^2+3x}$
45. You can walk 10 miles in the same time that it takes to travel 15 miles by car. If the car's rate is 3 miles per hour faster than your walking rate, find the average rate of each.
46. In still water, a boat averages 15 miles per hour. It takes the same amount of time to travel 20 miles downstream, with the current, as 10 miles upstream, against the current. What is the rate of the water's current?
47. A riverboat tour begins by going 60 miles upstream against a 5 mph current. There, the boat turns around and returns with the current. What still-water speed should the captain use to complete the tour in 5 hours?
48. An inlet pipe can fill an empty pool in 5 hours, and another inlet pipe can fill the pool in 4 hours. How long will it take both pipes to fill the pool?
49. Blaine can mow his yard in 3 hours. When his teen-aged daughter helps, they can complete the lawn in 2 hours. How long would it take the daughter to mow the entire yard herself?
50. The MTV crew will arrive in one week and begin filming the city for *Real World Kalamazoo*. The mayor is desperate to clean the city streets before filming begins. Two teams are available, one that requires 400 hours and one that requires 300 hours. If the teams work together, how long will it take to clean all of Kalamazoo's streets? Is this enough time before the cameras begin rolling?