

- Simplify each of the following.
  - $\frac{x^2 - 3x}{x^2 + 4x - 21} \cdot \frac{6x + x^2 - 7}{x^2 - x}$
  - $\frac{1 - 9p^2}{-p^2 + 8p - 15} \div \frac{3p - 1}{p - 3}$
  - $\frac{x^2 - 6x + 29}{2x + x^2 - 35} - \frac{x - 3}{x + 7}$
  - $3\sqrt{7} + 2\sqrt{63} - 3\sqrt{112}$
  - $(2 - \sqrt{7})(2 + \sqrt{7})$
  - $(7 - 3\sqrt{5})^2$
  - $\frac{3}{\sqrt{19} + 4}$
  - $\frac{a^{-2}b^3}{a^{-5}b^0}$
  - $\frac{a^{-2} + b^3}{a^{-5} - b^0}$
  - $(-2xy^3)^3 (-x^3yx^0)^{-2}$
  - $\frac{x^{-1} + y^{-1}}{x^{-2} - y^{-2}}$
- Find the exact value of  $-x^2 + 3x - 8$  if  $x = 3 - \sqrt{5}$ .
- Solve each of the following equations.
  - $\frac{5x + 1}{28} + \frac{12x - 6}{56} = \frac{x - 1}{14}$
  - $8x^2 + x^3 = 33x$
  - $2(x - 3) - \frac{x}{2} = \frac{3}{2}(x - 4)$
- Solve the formula  $C = \frac{5}{9}(F - 32)$  for  $F$ .
- Solve each of the following inequalities.
  - $3(x - 5) \leq 5x + 7$
  - $-9(x - 2) + 3(7x - 5) < \frac{12x + 3}{2}$
- Solve the system  $\begin{cases} 2x - 3y = -1 \\ 3x - 4y = 1 \end{cases}$
- Graph the straight lines determined by  $y = 2x - 3$  and  $x + 6 = 2y$ . Use your graph to find the coordinates of the intersection.
- Graph the parabola  $y = 8x + x^2 + 12$ . Clearly indicate the coordinates of five points, including vertex and intercepts.
- Find the value of  $N$  if the straight line  $2x + 5y = N$  passes through the point  $(-9, 3)$ .
- Find the value of  $N$  if the straight line  $Nx + y = -8$  passes through the point  $(5, 2)$ .
- A soda costs \$ 1.20 and a sandwich costs \$ 2.50. We purchased 23 items for a total of \$ 38. How many sodas and sandwiches did we purchase?