

1. Put the following lines in slope-intercept form, and find two points on the line.
  - (a)  $3x - 7y = 12$
  - (b)  $\frac{1}{5}y + x - 10 = 0$
  - (c)  $\frac{2}{3}x + \frac{1}{3}y = 2$
  
2. Find a line parallel to  $y = 3x + 4$  passing through the origin.
  
3. Find a line perpendicular to  $y - 4 = 3(x + 1)$  that passes through the point  $(2, 2)$ .
  
4. Put the following expressions in set notation using absolute value signs.
  - (a)  $-2 < x < 0$
  - (b)  $-7 < x + 3 < 3$
  - (c)  $3 \leq x - 2 \leq 9$
  
5. Solve by factoring.
  - (a)  $x^2 - 2x - 3$
  - (b)  $2x^2 + 7x - 4$
  - (c)  $10x^2 - 11x - 6$
  
6. Solve the following rational expressions.
  - (a)  $\frac{1}{x} = \frac{2x-4}{x-1}$
  - (b)  $\frac{3x}{2} = \frac{3x+1}{x-1}$
  - (c)  $\frac{x+2}{5} - \frac{x}{x-4} = 0$
  
7. Solve using key number method.
  - (a)  $\frac{(x+1)x}{x+4} \leq 0$
  - (b)  $\frac{(x+2)^2}{(x-3)} > 0$
  - (c)  $\frac{(x-3)(x+3)}{2x} \geq 0$
  
8. Solve by completing the square
  - (a)  $x^2 + 8x + 7 = 0$
  - (b)  $2x^2 - 12x + 12 = 0$

9. Find the center and radius of the circle.

(a)  $x^2 + y^2 - x + 2y - 5 = 0$

(b)  $x^2 + y^2 - 4x - 8y = 0$

10. Simplify.

(a)  $\frac{(xy)^6}{(x^{-2}y^{-4})^{-1}}$

(b)  $(xy^2)^2 - (x^{-1})^{-2}$

(c)  $\left(\frac{(x^{\frac{1}{2}}y^3)^{\frac{1}{3}}}{(xy)}\right)^{\frac{3}{2}}$

(d)  $(\sqrt{4} + 32^{\frac{1}{5}})^2$

11. Rationalize the denominator and simplify.

(a)  $\frac{1}{\sqrt{x-2}}$

(b)  $\frac{2x}{x+\sqrt{3}}$

(c)  $\frac{2}{x^{\frac{3}{4}}}$

(d)  $\frac{4}{\sqrt{x-3}+2}$

12. Let  $f(x) = x^3 - 2$  and  $g(x) = x - 1$ . Compute the following. (No need to simplify for e,f)

(a)  $(f + g)(0)$

(b)  $(fg)(a)$

(c)  $\frac{f(x+h)-f(x)}{h}$

(d)  $\frac{g(x+h)-g(x)}{h}$

(e)  $(f \circ g)(x)$

(f)  $(f \circ g)^{-1}(x)$

13. Find the inverse of each function (if possible), and the domain and range of both  $f$  and  $f^{-1}$ . (If there is no inverse find the domain of the function.)

(a)  $f(x) = 3x - 4$

(b)  $f(x) = \sqrt[3]{x} + 2$

(c)  $f(x) = \frac{1}{x-5}$

(d)  $f(x) = (x + 2)^2$