

1. 10 pts. each Let  $L$  be the line given by  $3y - 8x = -6$ .
- (a) Find the intercepts of  $L$ .
- (b) Graph  $L$  in the Cartesian coordinate system, labeling all points as well as the axes.
2. 10 pts. Find the exact distance between the points  $(-\frac{11}{3}, -\frac{1}{2})$  and  $(\frac{1}{3}, \frac{5}{2})$ , simplifying the radical if possible.

3. 10 pts. Find the center and radius of the circle given by

$$(x - 4)^2 + (y + 9)^2 = 121.$$

4. 10 pts. Given that  $f(x) = 3 - 4x^2$ , find  $f(-1)$ ,  $f(-x)$  and  $f(1 - t)$ .

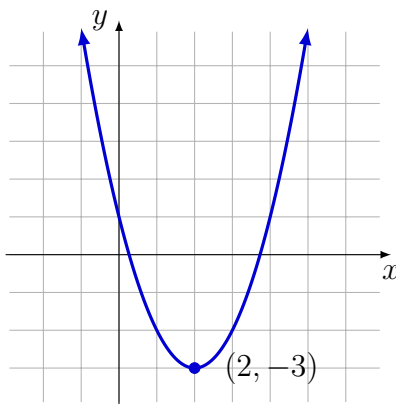
5. 10 pts. each Find the domain of the function using interval notation.

(a)  $f(x) = \frac{2x - 1}{3x + 2}$

(b)  $g(x) = \frac{5}{x^2 + 4x - 21}$

(c)  $h(x) = \sqrt{6x + 3} + 19$

6. 10 pts. Find the domain and range of the function having the graph below.



7. 10 pts. Find the slope of the line containing the points  $(16, -13)$  and  $(-8, -5)$ .
8. 10 pts. Write a slope-intercept equation for a line passing through  $(5, 6)$  with slope  $-\frac{3}{8}$ .

9. 15 pts. Joachim's two student loans total \$9000. One loan is at 5% simple interest, and the other is at 6% simple interest. At the end of one year, Joachim owes \$492 in interest. What is the amount of each loan? (Showing work is required, including setting up an algebraic equation.)
10. 10 pts. each Give the solution set of each in interval notation.
- (a)  $4x(x - 2) < 2(2x - 1)(x - 3)$
  - (b)  $-4 \leq 2x - 6 < 4$
  - (c)  $3x - 1 < -5$  or  $3x - 2 > 4$
11. 10 pts. each Let  $f(x) = \sqrt{x}$  and  $g(x) = \sqrt{3 - x}$ . Find the domain of each in interval notation.
- (a)  $f$  and  $g$
  - (b)  $f - g$
  - (c)  $ff$
  - (d)  $f/g$
12. 10 pts. each Let  $f(x) = 1 - x^2$  and  $g(x) = \sqrt{x^2 - 36}$ .
- (a) Find  $(f \circ g)(x)$  and  $(g \circ f)(x)$ .
  - (b) Find the domain of  $f \circ g$  in interval notation.
  - (c) Find the domain of  $g \circ f$  in interval notation.
13. 10 pts. Given

$$h(x) = \frac{1}{\sqrt[3]{3x + 7}},$$

find functions  $f$  and  $g$  (neither being the identity function) such that  $(f \circ g)(x) = h(x)$ .