MATH 120
SPRING 2019   NAME:
EXAM 1

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 $\left(-\frac{11}{3}, -\frac{1}{2}\right)$ and $\left(\frac{1}{3}, \frac{5}{2}\right)$, simplifying the radical if possible.

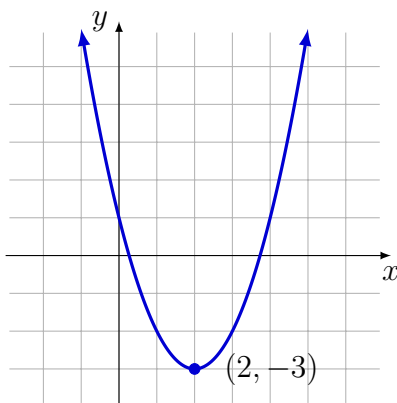3. [10 pts.] Find the center and radius of the circle given by

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

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

5. [10 pts. each] Give the domain of the function using interval notation.

   (a) $g(x) = \dfrac{8 - x}{x^2 - 7x}$

   (b) $h(x) = \sqrt{2x} - \sqrt{18 - x}$

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

$(2, -3)$

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.] Morgan's Seeds has a rectangular test plot with a perimeter of 322 m. The length is 25 m more than the width. Find the dimensions of the plot.

10. $\boxed{\text{10 pts. each}}$ Give the solution set of each in interval notation.

(a) $-5 < \frac{1}{2}(3x + 1) \le 7$

(b) $x + 14 \le -\frac{1}{4}$ or $x + 14 \ge \frac{1}{4}$

11. $\boxed{\text{10 pts.}}$ Given that

$$F(x) = \begin{cases} -5x - 8, & \text{for } x < -2 \\ \frac{1}{2}x + 5, & \text{for } -2 \le x \le 4 \\ 10 - 2x, & \text{for } x > 4 \end{cases}$$

find $F(-4)$, $F(-2)$, $F(4)$, and $F(6)$.

12. $\boxed{\text{10 pts. each}}$ Let $f(x) = 3/(x - 2)$ and $g(x) = \sqrt{x - 1}$. Find the domain of each in interval notation.

(a) f and g

(b) $f + g$

(c) f/g

(d) g/f

13. $\boxed{\text{10 pts. each}}$ Let $f(x) = x^2 + 2$ and $g(x) = \sqrt{3 - x}$.

(a) Find $(f \circ g)(x)$ and $(g \circ f)(x)$.

(b) Give the domain of $f \circ g$ in interval notation.

(c) Give the domain of $g \circ f$ in interval notation.

14. $\boxed{\text{10 pts.}}$ Given

$$h(x) = \frac{x^3 - 1}{x^3 + 1},$$

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