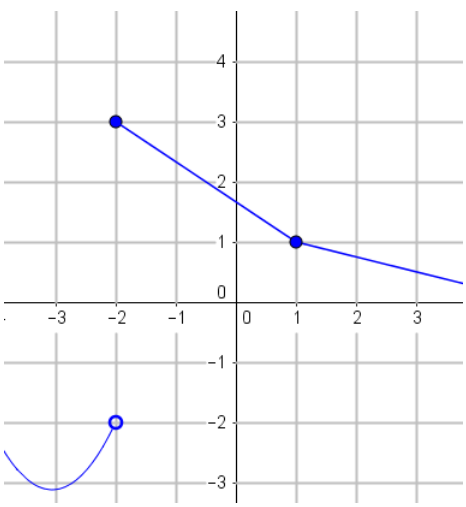
MTH 1000, Exam 1 Practice

1. Consider the points (-3,1) and (4,5).
   (a) Find the distance between the points.
   (b) Find the midpoint between the points.
2. Consider the graph of a function $f(x)$ below.
3. Find the equation of the line passing through points $(4, 4)$ and $(-2, 5)$, and find its x- and y-intercepts.
4. Find the equation of the line (in $y = mx + b$ form) that passes through the point $(4, -6)$ and (a) is perpendicular to the line $y = 4x + 1$, and (b) is parallel to the line $-4x - 2y = 1$.
5. By completing the square, find the center and radius for the circle with the equation
$$4y + x^2 + y^2 - 10x - 7 = 0.$$
   Is the graph of the circle the graph of a function?
6. Find the equation of the circle if $(2, 2)$ and $(6, 6)$ are points on opposite ends of the same diameter.
7. State the domain for the functions in interval notation.
   (a) $f(x) = \frac{3-x}{x}$
   (b) $g(x) = \frac{4}{\sqrt{x-1}}$



Consider the graph of a function f.
   (a) Is f a continuous function?
   (b) Find $f(-2)$ and $f(1)$.
   (c) Find the formula for f.
   (d) Find the x-intercept(s).
   (e) Find the y-intercept(s).
   (f) Find the domain and range of f.

8. Consider the piecewise function $f(x) = \begin{cases} x - 8, & \text{if } x < -8 \\ \sqrt[3]{x}, & \text{if } -8 \le x \le 8 \\ -x + 8, & \text{if } x > 8 \end{cases}$.
   (a) Graph f.
   (b) State the domain and range of f.
   (c) Does the function have x-axis symmetry, y-axis symmetry, origin symmetry, or none?
   (d) Find the formula and graph of f if it is reflected about the y-axis.
9. Plot $-\frac{1}{2}(x - 3)^2 - 2$.

10. Plot $-\sqrt[3]{x}+1$.

11. Plot $f(x)=(x-2)^2+4$.

12. Consider the quadratic function $f(x)=x^2+3x+\frac{3}{4}$.

    (a) Find the intercepts.

    (b) Find the vertex.

    (c) Plot f.

    (d) Find the domain and range of f.

    (e) Is f a continuous function?

    (f) Does f have x-axis symmetry, y-axis symmetry, origin symmetry, or none?

13. If an arrow is fired upward and its height t seconds after the shot is $h(t)=-4t^2+16t+10$ meters.

    (a) Find the maximum height

    (b) How long does it take for the arrow to fall back to the ground?