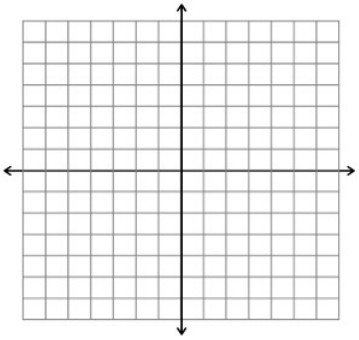
PRECALC AB PERIOD: _____ NAME:_____

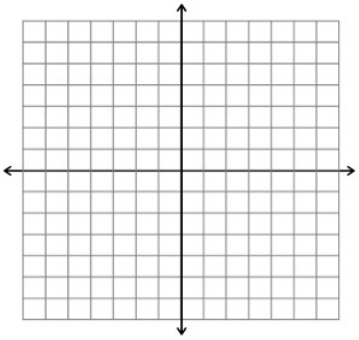
# Worksheet 5 - Lesson 21

1. These are important "base graphs" you should know. Sketch each function and indicate the domain and range, in interval notation.

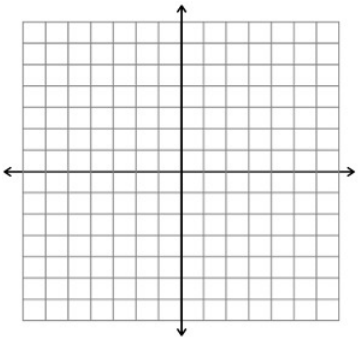
(a) $f(x) = x$



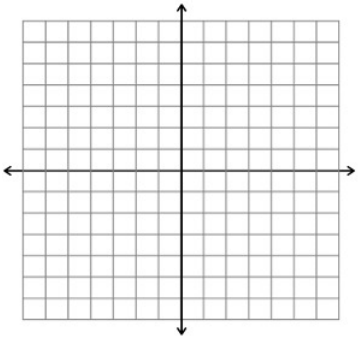
(b) $f(x) = x^2$



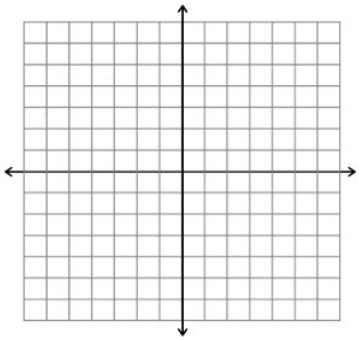
(c) $f(x) = x^3$



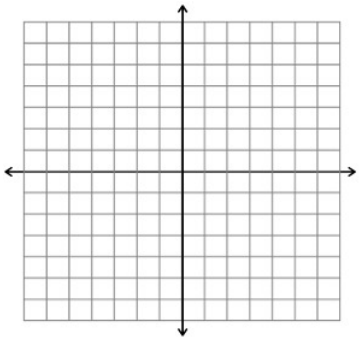
(d) $f(x) = \frac{1}{x}$



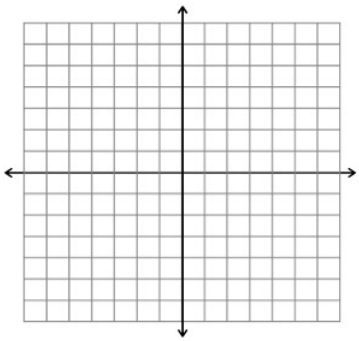
(e) $f(x) = \frac{1}{x^2}$



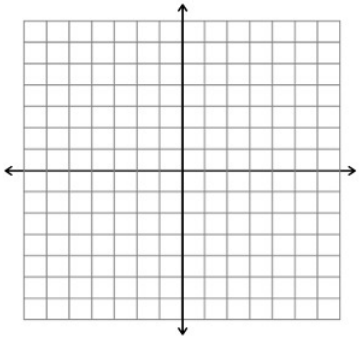
(f) $f(x) = \sqrt{x}$



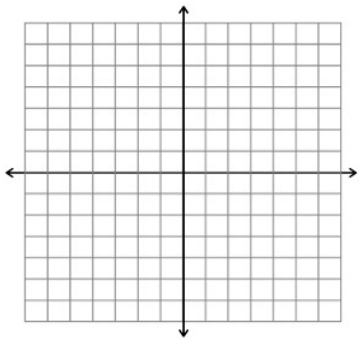
(g) $f(x) = \sqrt[3]{x}$



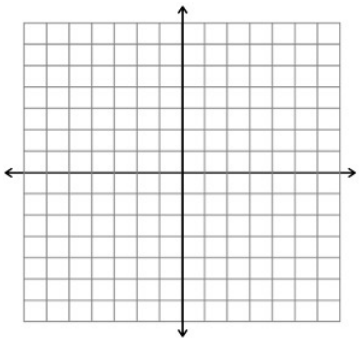
(h) $f(x) =\mid x \mid$



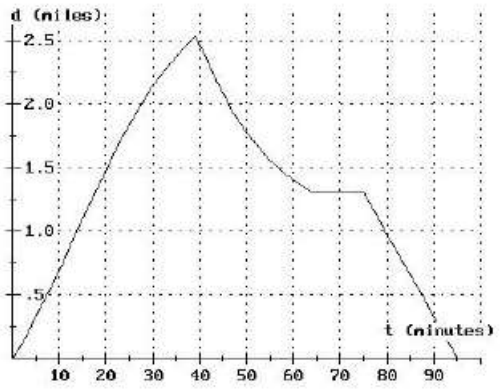
(i) $f(x) = k$



(j) $f(x) = \sqrt{c^2 - x^2}$



2. Holly, lives near the beach and takes a walk each evening. She takes a straight path between here house and the beach and back. The graph below shows her distance, $d$, from home $t$ minutes after 6:30 p.m. on one particular evening. Use this graph to approximate the best possible answer to the following questions.




distance $t$ minutes after 6:30 p.m.

(a) Approximately how far from home was she at 6:35 p.m.?

(b) At approximately what time(s) was she 1 mile from home?

(c) During approximately what time interval(s) was she more than half a mile from home?

(d) What was Holly doing between 7:35 and 7:45 p.m.?

(e) How far is the beach from Holly's house? Approximately when did she reach the beach?

(f) Approximately how fast was she walking between 6:30 and 6:45 p.m.?

(g) Approximately when was Holly walking fastest? How do you know?

(h) How far did she walk altogether? When did she get home?

(i) Did Holly walk at a constant speed on this particular trip? How do you know?

3. Use the numerical representation of $f(x)$ below to match the numerical information in column A with the symbolic representation in column B.

| $x$ | $-4$ | $-2$ | $0$ | $2$ | $4$ |
|---|---|---|---|---|---|
| $f(x)$ | 5 | 1 | 6 | 2 | 7 |

**Column A**

| $x$ | $-4$ | $-2$ | $0$ | $2$ | $4$ |
|---|---|---|---|---|---|
| $g(x)$ | 7 | 3 | 8 | 4 | 9 |

| $x$ | $-2$ | $-1$ | $0$ | $1$ | $2$ |
|---|---|---|---|---|---|
| $h(x)$ | 5 | 1 | 6 | 2 | 7 |

| $x$ | $-2$ | $0$ | $2$ | $4$ | $6$ |
|---|---|---|---|---|---|
| $k(x)$ | 5 | 1 | 6 | 2 | 7 |

| $x$ | $-8$ | $-4$ | $0$ | $4$ | $8$ |
|---|---|---|---|---|---|
| $m(x)$ | 5 | 1 | 6 | 2 | 7 |

| $x$ | $-4$ | $-2$ | $0$ | $2$ | $4$ |
|---|---|---|---|---|---|
| $n(x)$ | $-5$ | $-1$ | $-6$ | $-2$ | $-7$ |

| $x$ | $4$ | $2$ | $0$ | $-2$ | $-4$ |
|---|---|---|---|---|---|
| $p(x)$ | 5 | 1 | 6 | 2 | 7 |

| $x$ | $7$ | $5$ | $3$ | $1$ | $-1$ |
|---|---|---|---|---|---|
| $q(x)$ | 11 | 6 | 10 | 5 | 9 |

**Column B**

(i) $f(x-2)$

(ii) $f\left(\frac{1}{2}x\right)$

(iii) $f(x)+2$

(iv) $f(-x)$

(v) $f(x-3)+4$

(vi) $-f(x)$

(vii) $f(x+2)$

(viii) $f(2x)$

4. In your own words, how would the graph of $y=-3f(x+5)-4$ compare to $y=f(x)$?

5. Write an expression that would represent the graph of $y=f(x)$ that has been:

   (a) Expaned vertically by a factor of 5.

   (b) Shifted 3 units to the right, then reflected about the $y$-axis. (Hint: Order matters)

   (c) Shruch horizontally by a factor of 2.

   (d) Reflected about the $x$-axis, then shifted 4 units down.

   (e) Reflected about the $y$-axis, then shifted 7 units to the left. (Hint: Order matters)