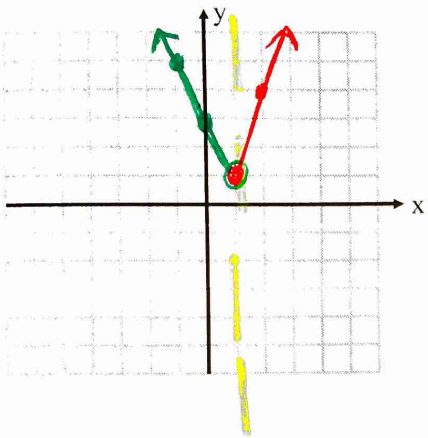
AFM HW 4 – review lessons 1-3

Name key

For each problem, graph each function by hand and find the domain and range.

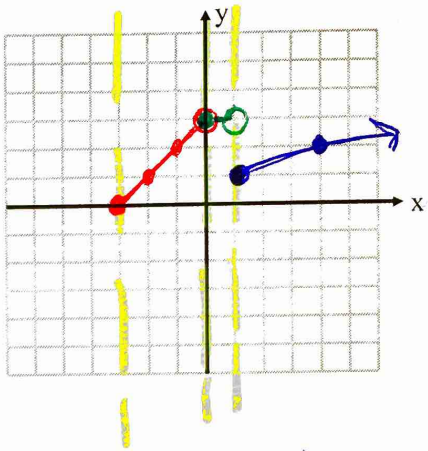
1. $f(x) = \begin{cases} -2x + 3, & x < 1 \\ 3x - 2, & x \geq 1 \end{cases}$



DOMAIN: $(-\infty, \infty)$

RANGE: $[1, \infty)$

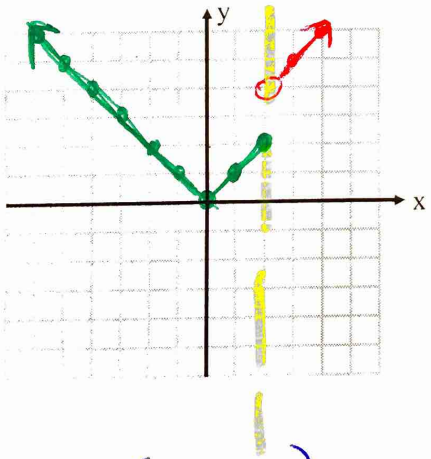
2. $f(x) = \begin{cases} 3 + x, & -3 \leq x < 0 \\ 3, & 0 \leq x < 1 \\ \sqrt{x}, & x \geq 1 \end{cases}$



DOMAIN: $[-3, \infty)$

RANGE: $[0, \infty)$

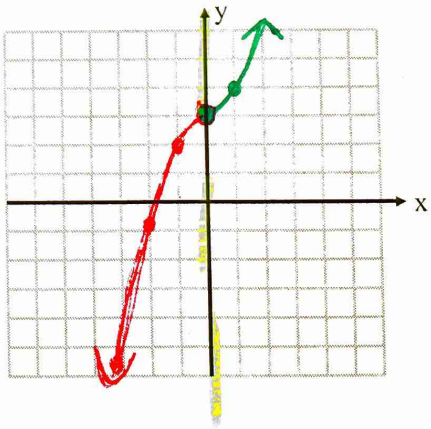
3. $f(x) = \begin{cases} |x|, & x \leq 2 \\ x + 2, & x > 2 \end{cases}$



DOMAIN: $(-\infty, \infty)$

RANGE: $[0, \infty)$

4. $f(x) = \begin{cases} x^2 + 3, & x \geq 0 \\ -x^2 + 3, & x < 0 \end{cases}$



DOMAIN: $(-\infty, \infty)$

RANGE: $(-\infty, \infty)$

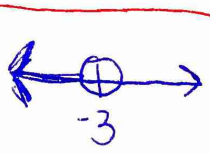
Solve the following inequalities. State your answers in interval notation.

5. $-5(1+7m) > 100$

$1+7m < -20$

$7m < -21$

$m < -3$



$(-\infty, -3)$

6. $1 \leq x+5 < 14$

$-5 \quad -5 \quad -5$

$-4 \leq x < 9$

$[-4, 9)$

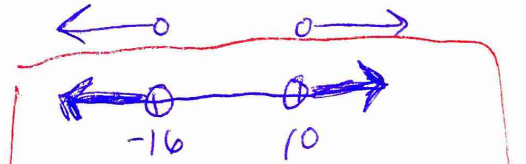
7. $|3+b| > 13$ OR

(a) $3+b > 13$

$b > 10$

(b) $3+b < -13$

$b < -16$



$(-\infty, -16) \cup (10, \infty)$

8. $-8|n-2| + 10 \geq -78$

$-8|n-2| \geq -88$

$|n-2| \leq 11$

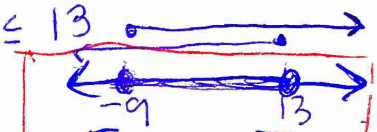
AND

(a) $n-2 \leq 11$

$n \leq 13$

(b) $n-2 \geq -11$

$n \geq -9$



$[-9, 13]$

State the domain and range of each in interval notation.

9. $f(x) = \sqrt{-x-5} + 6$

DOMAIN: $(-\infty, -5]$

RANGE: $[6, \infty)$

$-x - 5 \geq 0$

$-x \geq 5$

$x \leq -5$

10. $f(x) = x^2 + 2x - 3$

DOMAIN: $(-\infty, \infty)$

RANGE: $[-4, \infty)$

11. $f(x) = \frac{1}{x^2-9}$

DOMAIN: $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$

RANGE: $(-\infty, 0) \cup (0, \infty)$

$x^2 - 9 = 0$

$x^2 = 9$

$x = \pm 3$