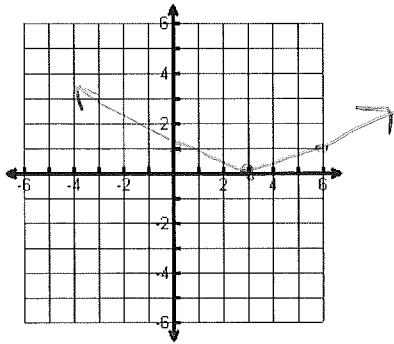# Algebra 2: Writing Absolute Value Equations

Warm-up: Graph each function below. State the given information.

1) $y = \dfrac{1}{3}|x-3|$
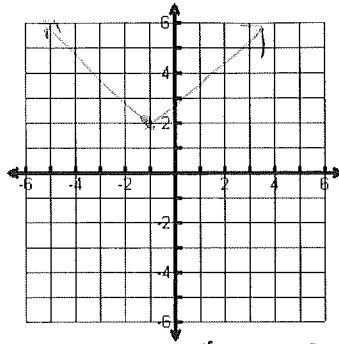
2) $f(x) = |x+1| + 2$

3) $f(x) = -2|x+3|$

D: $\mathbb{R}$ R: $[0, \infty)$

Int: $x=3$ $y=1$

Transf: shrink ⅓, right 3

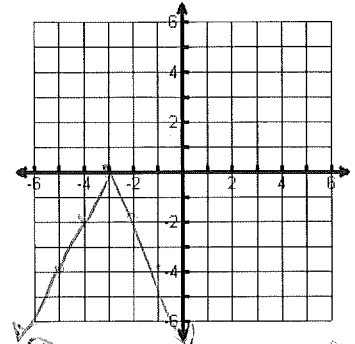D: $\mathbb{R}$ R: $(2, \infty)$

Int: $y=3$

Transf: left 1, up 2
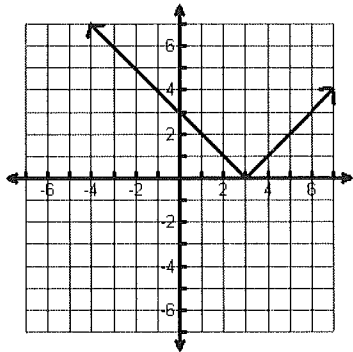
D: $\mathbb{R}$ R: $(0, \infty)$

Int: $x=-3$ $y=-6$

Transf: reflect, stretch ×2 left 3

EXAMPLES: Write an equation for each graph below. List the transformations to assist you. Also list domain, range, and intercepts.
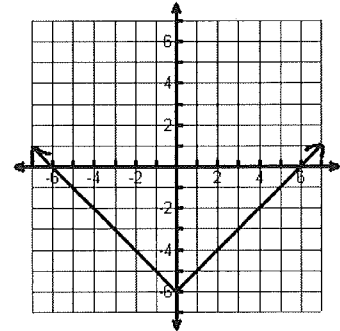
1) Eqn: _____

$y = |x-3|$

Domain: $\mathbb{R}$ Range: $[0, \infty)$

Intercept(s): $x=3$ $y=3$ Transf: →3

2) Eqn: _____

$y = |x| - 6$
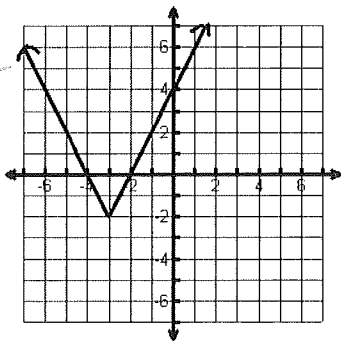
Domain: $\mathbb{R}$ Range: $[-6, \infty)$

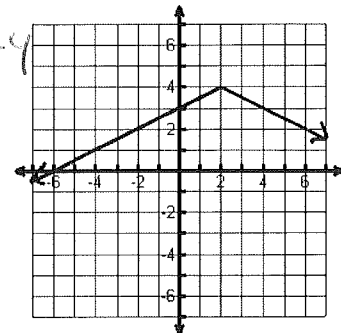Intercept(s): $x=-6/6$ $y=-6$ Transf: ↓6

3) Eqn: _____

$y = 2|x+3| - 2$

Domain: $\mathbb{R}$ Range: $[-2, \infty)$

Intercept(s): $x=-2/-4$ $y=4$ Transf: ←3 ↓2 stretched by 2

4) Eqn: _____

$y = -\frac{1}{2}|x-2| + 4$

Domain: $\mathbb{R}$ Range: $(-\infty, 4]$

Intercept(s): $x=-6$ $y=3$ Transf: →2, ↑4, reflect stretched by ½