

$$f(x) = 2 + \sqrt{x-3}$$

$$g(x) = \frac{5}{x^2 - x - 6}$$

Find domain:

$$\textcircled{f} \quad x-3 \geq 0$$

$$x \geq 3$$

$$\text{Dom: } [3, \infty)$$

$$\textcircled{g} \quad x^2 - x - 6 = 0$$

$$(x-3)(x+2) = 0$$

$$x-3=0$$

$$x+2=0$$

$$x=3$$

$$x=-2$$

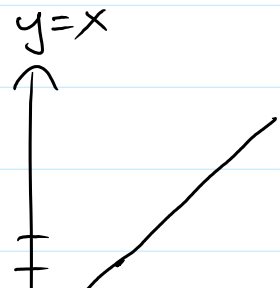
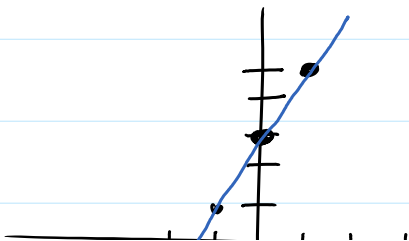
$$\text{Dom: } (-\infty, -2) \cup (-2, 3) \cup (3, \infty)$$

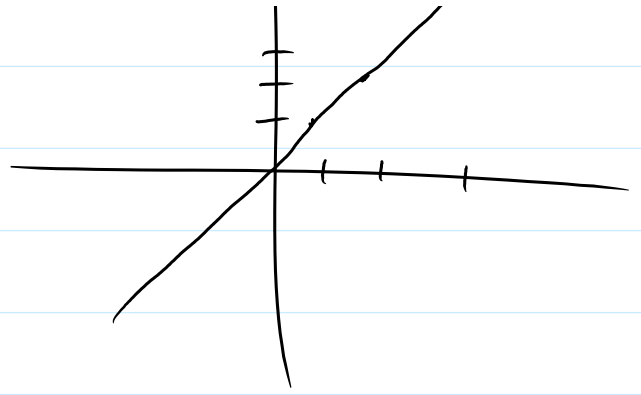
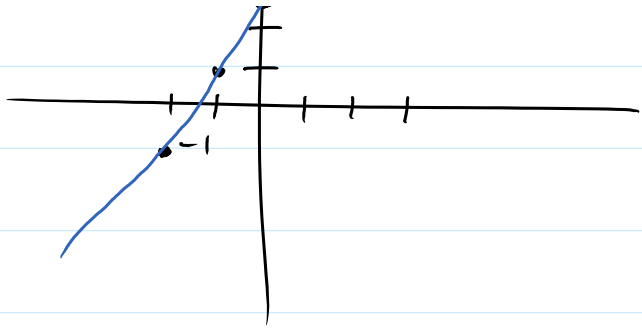
$$f(x) = \frac{\sqrt{x-3}}{(x-3)(x+2)} \quad \text{Dom: } (3, \infty)$$

Section 2.5

slope y-int

$$f(x) = \textcircled{2}x + \textcircled{3}$$



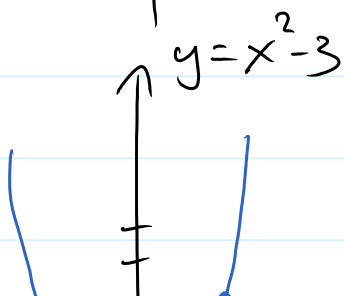
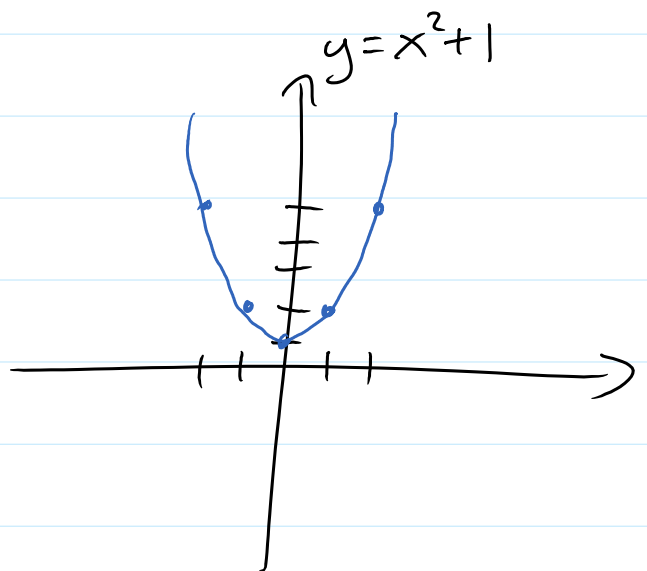
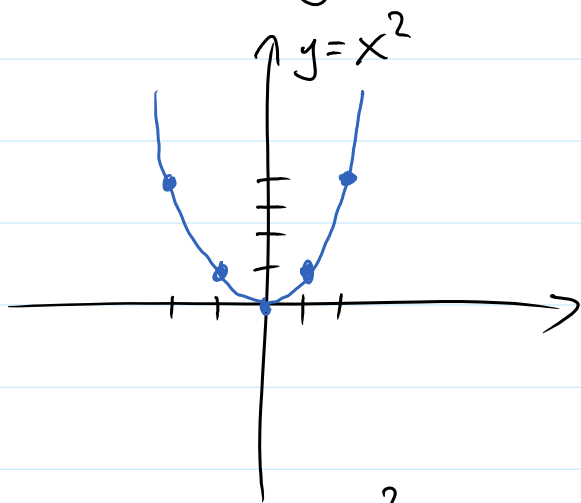


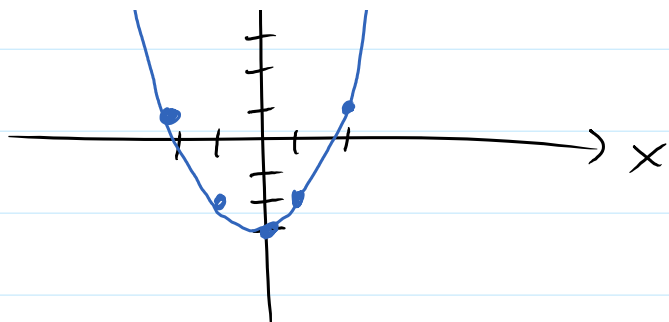
Function transformations

① vertical shift

• $y = f(x) + c$ is the graph of $y = f(x)$ shifted up by c units

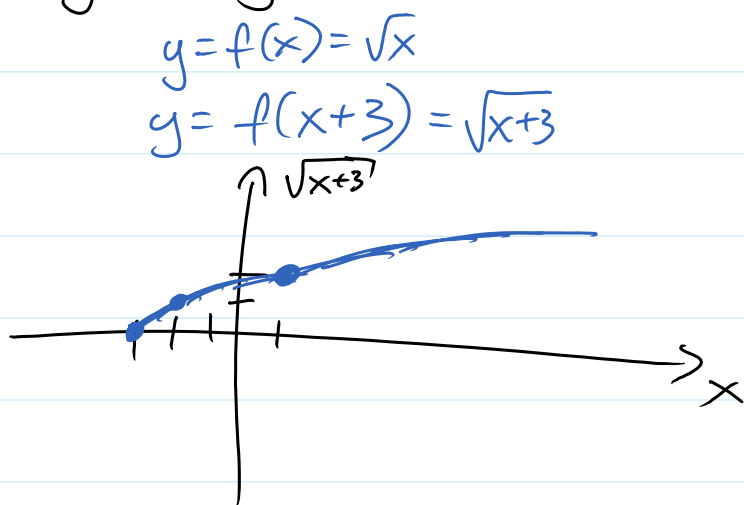
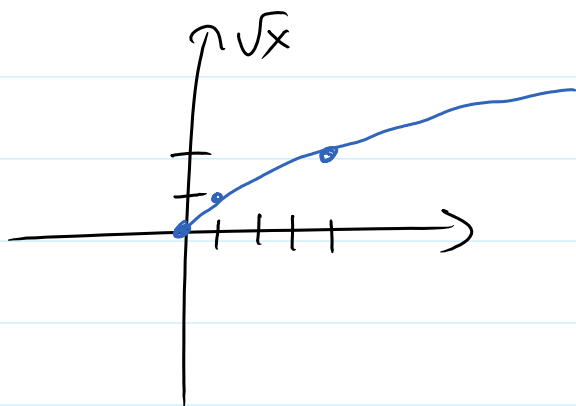
• $y = f(x) - c$ is the graph of $y = f(x)$ shifted down by c units





② horizontal shift

- $y = f(x+c)$ is the graph of $y = f(x)$ shifted to the left by c units.
- $y = f(x-c)$ is the graph of $y = f(x)$ shifted to the right by c units.

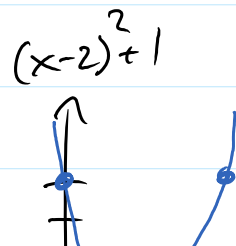
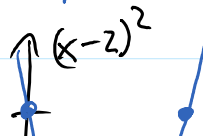
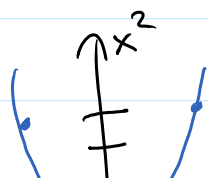


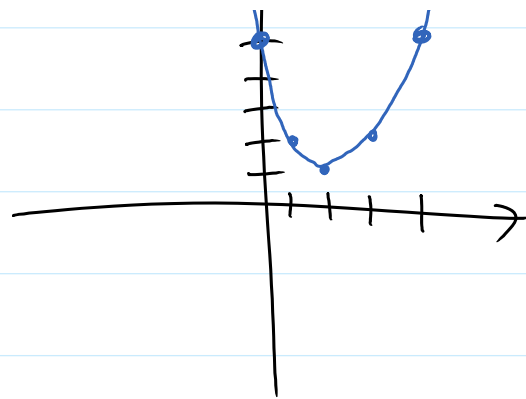
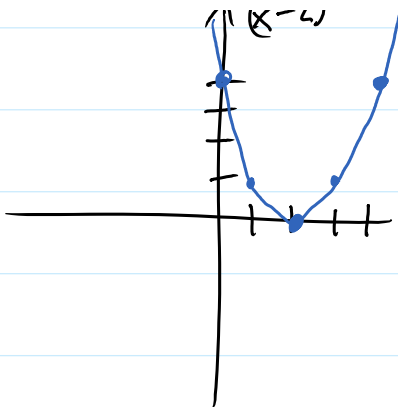
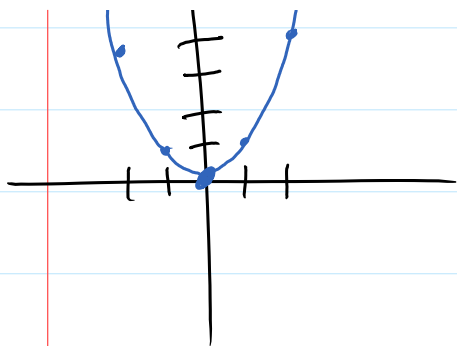
Ex: Use graph transformations to plot $y = (x-2)^2 + 1$

$$y = x^2 \rightarrow y = (x-2)^2 \rightarrow y = (x-2)^2 + 1$$

↑
shift
right by 2

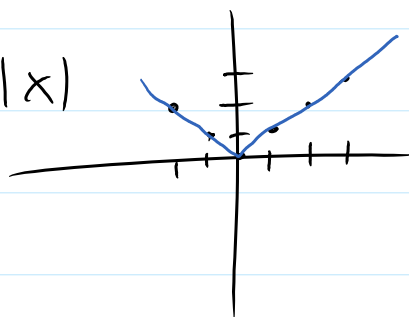
↑
shift
up by 1 unit



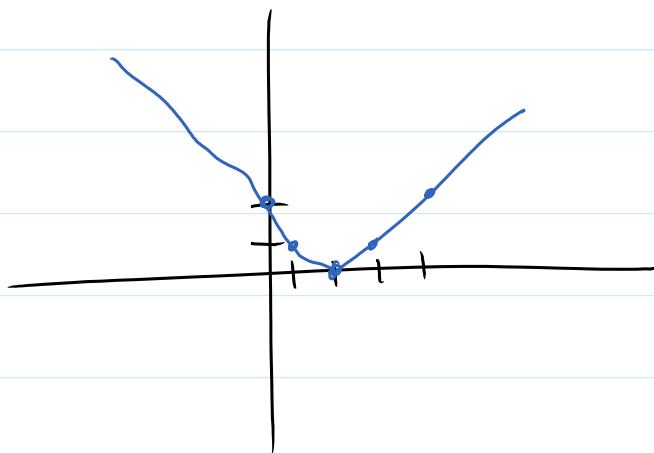


Worksheet

(2) Basic func: $y = |x|$



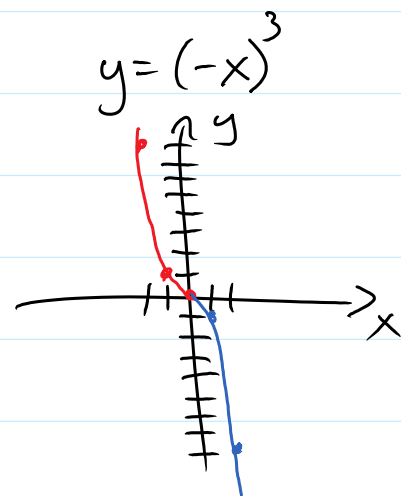
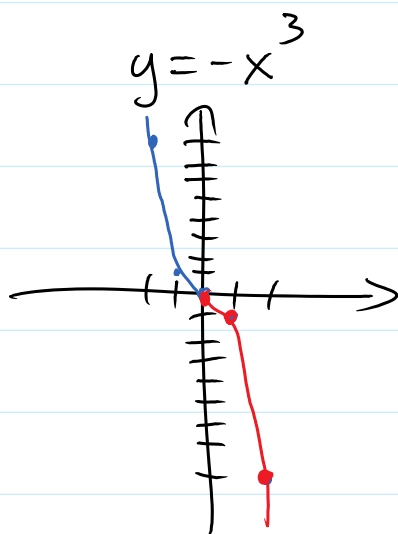
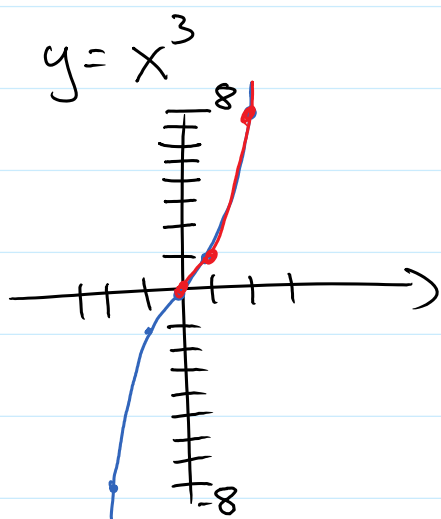
$$y = |x - 2|$$



(3) Reflections

- The graph of $y = f(x)$ is the graph of $y = f(x)$ reflected about the y-axis.
- The graph of $y = -f(x)$ is the graph of

- The graph of $y = -f(x)$ is the graph of $y = f(x)$ reflected about the x -axis.



④ Vertical stretch or shrink

Let f be a function and c a positive number.

- If $c > 1$, the graph of $y = cf(x)$ is the graph $y = f(x)$ vertically stretched by multiplying each of its y -coordinates by c .

- If $0 < c < 1$, ... $y = cf(x)$ is the graph $y = f(x)$ vertically shrunk by multiplying each of its y -coordinates by c .

