

Brief Review of Shifting and Intercepts

Shifting: Suppose c is a positive number.

1. Vertical: $f(x) + c \rightarrow$ Shifts UP by c , $f(x) - c \rightarrow$ Shifts DOWN by c

2. Horizontal: $f(x + c) \rightarrow$ Shifts LEFT by c , $f(x - c) \rightarrow$ Shifts RIGHT by c

Intercepts:

1. y - intercept: Where $f(x)$ crosses the y - axis (set $x = 0$, solve for y)

2. x - intercept: Where $f(x)$ crosses the x - axis (set $y = 0$, solve for x)

eg $f(x) = 5x^2 - \sqrt{x}$. Find formula when f is shifted up by 1
and right by 3

① Shift up by 1: $f(x) + 1$

② " right by 3: $f(x) + 1 \rightarrow f(x-3) + 1$

$$\Rightarrow f(x-3) + 1 = 5(x-3)^2 - \sqrt{x-3} + 1$$

eg Find intercepts of $f(x) = x^2 - 3x - 4$

① y -int ($x=0$): $f(0) = -4 \rightarrow y$ -int.

② x -int ($y=0$): $x^2 - 3x - 4 = 0 \Rightarrow (x-4)(x+1) = 0$
 $x=4, x=-1$