

Determine the point(s) of intersection of the line,
 $y = 2x - 10$ and the parabola, $y = -x^2 + 5x + 8$

$$2x - 10 = -x^2 + 5x + 8$$

$$x^2 - 3x - 18 = 0$$

$$(x - 6)(x + 3) = 0$$

$$\downarrow$$
$$x - 6 = 0$$

$$x = 6$$

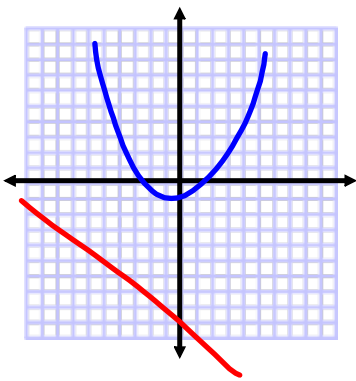
$$\downarrow$$
$$x + 3 = 0$$

$$x = -3$$

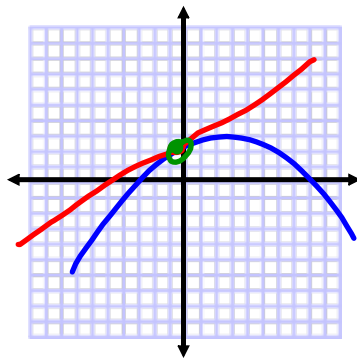
$$\otimes -18$$
$$\oplus -3$$
$$-6, 3$$

Number of points of Intersection

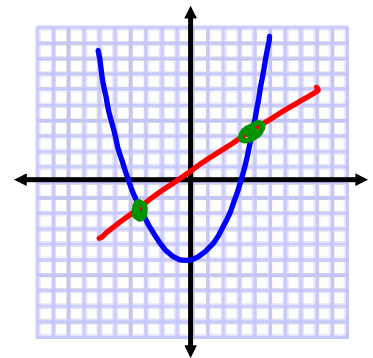
Zero



One



Two



Determine the points of intersection between the parabola $y = x^2 + 2$ and the line $y = 3$

make the equations equal

$$x^2 + 2 = 3 \quad -2$$

$$\sqrt{x^2} = \sqrt{1} \quad \text{solve}$$

$$x = \pm 1$$

the sub. $x=1$ and $x=-1$
into ANY equation.

$$y = x^2 + 2$$

$$y = (1)^2 + 2 \quad \leftarrow$$

$$= 3$$

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

$$y = 3$$

\therefore the Points of intersection
are $(1, 3)$ and $(-1, 3)$

Let $f(x) = -2x^2 + 3x + 4$ and $g(x) = x - 2$

Determine the points of intersection between $f(x)$ and $g(x)$

$$f(x) = g(x)$$

$$\textcircled{-2x^2 + 3x + 4} = x - 2 \quad \text{Move everything to one side}$$

$$+2x^2 - 3x - 4$$

$$0 = 2x^2 - 2x - 6$$

a b c

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(2)(-6)}}{2(2)}$$

$$x = \frac{2 \pm \sqrt{4 + 48}}{4}$$

$$x = \frac{2 \pm \sqrt{52}}{4}$$

$$x = \frac{2 + 7.2}{4}$$

$$\textcircled{= 2.3}$$

$$x = \frac{2 - 7.2}{4}$$

$$\textcircled{= -1.3}$$

Sub these x answers into any equation to get y values.

$$g(x) = x - 2$$

$$g(2.3) = 2.3 - 2$$

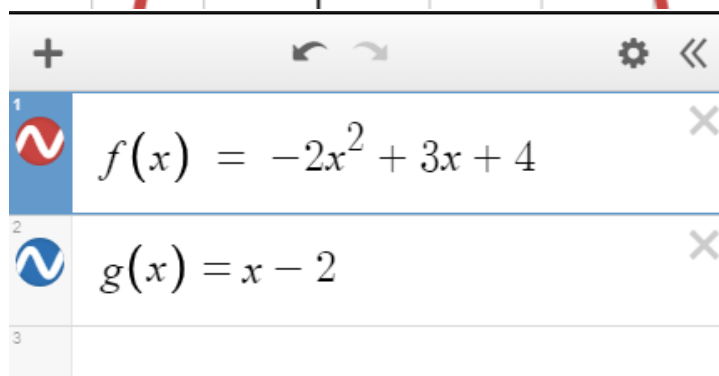
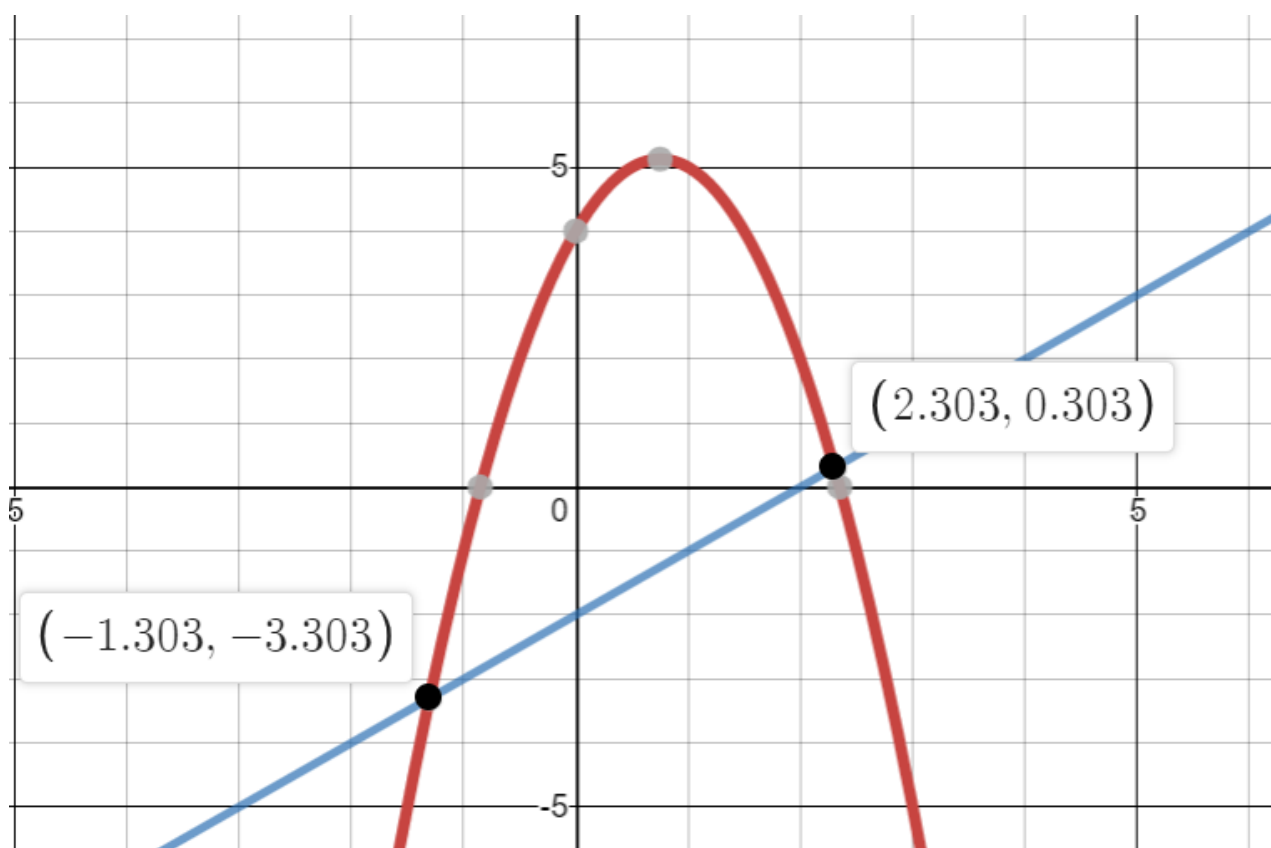
$$= 0.3$$

$$g(-1.3) = -1.3 - 2$$

$$= -3.3$$

The points of intersection are (2.3, 0.3) and (-1.3, -3.3)

The points of intersection are $(2.3, 0.3)$ and $(-1.3, -3.3)$



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1, 2, 3, 7, 10