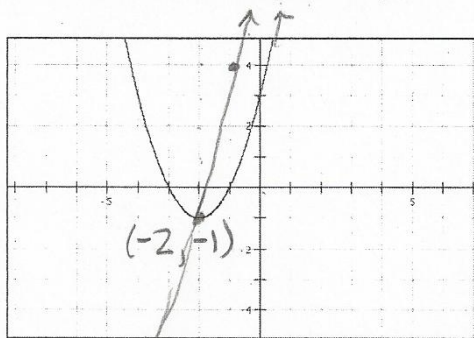


Intersections

A line with slope 5 passes through the vertex of this parabola. Does it intersect the parabola in another point (other than the vertex)? If so, find the point of intersection. If not, explain why.



$$y = (x+1)(x+3)$$

$$(y+1) = 5(x+2)$$

$$y+1 = 5x+10$$

$$y = 5x+9$$

$$(x+1)(x+3) = 5x+9$$

$$x^2 + 3x + 1x + 3 = 5x + 9$$

$$x^2 + 4x + 3 = 5x + 9$$

$$x^2 - 4x - 3 = 6$$

$$x^2 - 4x - 9 = 0$$

$$\sqrt{x^2} = \sqrt{x+6}$$

x	line y	u y
-2	-1	-1
-1	4	0
0	9	3
1	14	8
2	19	15
3	24	24

will intersect again at (3, 24)

Now, think of all possible lines that pass through the vertex of this parabola. Which lines intersect the parabola again at another point and which ones do not? Explain.

- A line that is horizontal or vertical will not intersect it again.
- Lines with slope 2, 3, and 4, for example, will cross it again.

Finally, think of all possible lines with a slope of 5. Which of the lines intersect the parabola? How many times? Explain.

Any line that has a slope of 5 and a y-intercept of at least 3 will intersect it twice.