AChor/MBF3C **Name: _____**

Date: _____

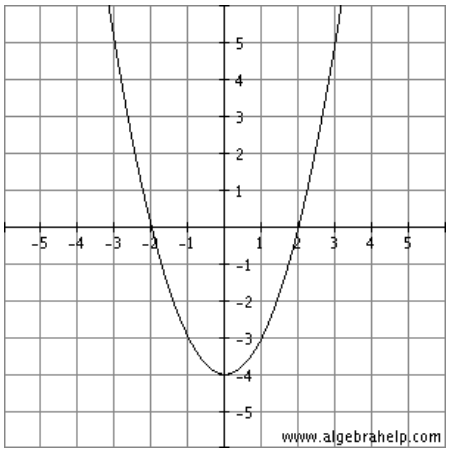
Worksheet 4-8: Interpret Graphs of Quadratic Relations

Besides the vertex, minimum or maximum *y*-value, and the axis of symmetry, *x*- and *y*-intercepts of a quadratic relation are also important information when interpreting a quadratic relation.

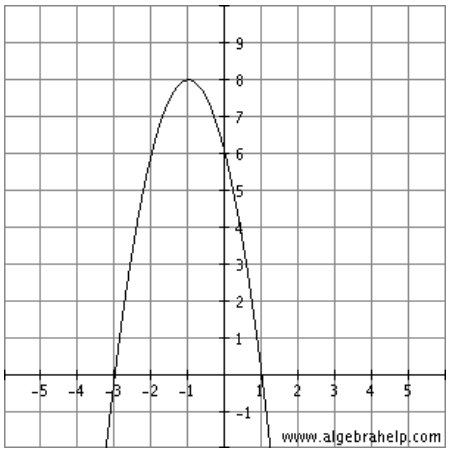
> *x*-intercept is the *x*-coordinate of the point where the parabola crosses or touches the *x*-axis.
>
> *y*-intercept is the *y*-coordinate of the point where the parabola crosses or touches the *y*-axis.

1. State the *x*- and *y*-intercepts of each quadratic relation.

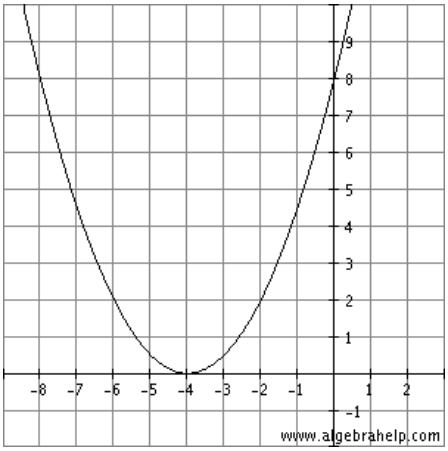
(a)



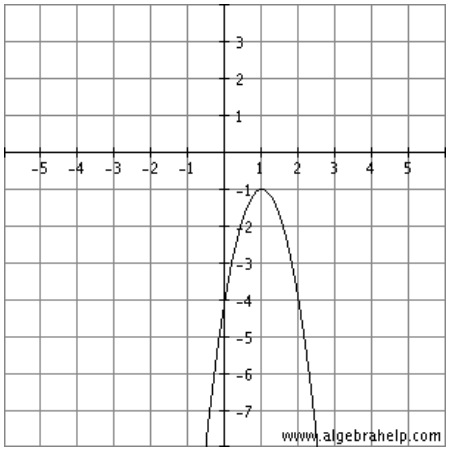
(b)



(c)



(d)



Assigned Work: WS 4-8; p. 222 #1 (a to f), #2-4; p. 271 #1-2

To find the *x*- and *y*-intercepts of a quadratic relation algebraically,

→ **substitute $x = 0$** into the quadratic equation to find the *y*-intercept.

→ **substitute $y = 0$** into the quadratic equation to find the *x*-intercept(s).

2. Find the *y*-intercept of each relation.

(a) $y = -3(x+2)^2 - 9$

(b) $y = 0.1x^2 + 0.4x + 1.8$

(c) $y = 2(x-3)^2 + 12$

(d) $y = -4x^2 - 8x - 9$

3. Find the *x*-intercept of each relation.

(a) $y = 2(x-3)^2 - 8$

(b) $y = x^2 + x - 42$

(c) $y = -3(x+5)^2 + 27$

(d) $y = 2x^2 - 6x - 36$

4. A construction worker drops his wrench. Its fall is modelled by the relation $h = -4.9t^2 + 342$, where h is the height above the ground, in metres, and t is the time after the wrench was dropped, in seconds.

(a) How far above the ground was the wrench when it was dropped?

(b) How far has the wrench fallen after 5 seconds?

(c) When will the wrench hit the ground?

5. A football player kicks a football held 0.5 m above the ground. The football reaches a maximum height of 30 m at a horizontal distance of 18 m from the player.

(a) Determine a quadratic relation that models the path of the football.

(b) At what horizontal distance from the player does the football hit the ground?

Answers: **1.** (a) x-intercepts = 2 and –2, y-intercept = –4, (b) x-intercepts = 1 and –3, y-intercept = 6, (c) x-intercept = –4, y-intercept = 8, (d) x-intercept = none, y-intercept = –4;
2. (a) –21, (b) 1.8, (c) 30, (d) –9; **3.** (a) 5 or 1, (b) 6 or –7, (c) –2 or –8, (d) 6 or –3
4. (a) 342 m above, (b) 342 – 219.5 = 122.5 m, (c) after 8.4 s;
5. (a) $y = -0.091(x-18)^2 + 30$, (b) 36.16 m from the player