To use Quad. Formula, $y=0$

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

$a = 1$

$b = -6$

$c = -7$

Your Turn

Solve using the quadratic formula.

Must set $y=0$ first

7. $x^2 - 6x - 7 = 0$

$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(-7)}}{2(1)}$

$x = \frac{6 \pm \sqrt{64}}{2} \rightarrow \frac{6 \pm 8}{2}$

$\frac{6+8}{2}$ $\boxed{E}$ $\quad$ $\frac{6-8}{2}$ $\boxed{E}$

7 $\quad$ -1

8. $2x^2 = 8x - 7$

$2x^2 - 8x + 7 = 0$

$a = 2$

$b = -8$

$c = 7$

$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(2)(7)}}{2(2)}$

$x = \frac{8 \pm \sqrt{8}}{4}$

$\frac{8 + \sqrt{8}}{4}$ $\boxed{E}$ 2.71

$\frac{8 - \sqrt{8}}{4}$ $\boxed{E}$ 1.29

Explain 3 Using the Discriminant with Real-World Models

Given a real-world situation that can be modeled by a quadratic equation, you can find the number of real solutions to the problem using the discriminant, and then apply the quadratic formula to obtain the solutions. After finding the solutions, check to see if they make sense in the context of the problem.

In projectile motion problems the projectile height h is modeled by the equation $h = -16t^2 + vt + s$, where t is the time in seconds the object has been in the air, v is the initial vertical velocity in feet per second, and s is the initial height in feet. The -16 coefficient in front of the t^2 term refers to the effect of gravity on the object. This equation can be written using metric units as $h = -4.9t^2 + vt + s$, where the units are converted from feet to meters. Time remains in units of seconds.

Example 3 **For each problem, use the discriminant to determine the number of real solutions for the equation. Then, find the solutions and check to see if they make sense in the context of the problem.**

(A) A diver jumps from a platform 10 meters above the surface of the water. The diver's height is given by the equation $h = -4.9t^2 + 3.5t + 10$, where t is the time in seconds after the diver jumps. For what time t is the diver's height 1 meter?

Substitute $h = 1$ into the height equation. Then, write the resulting quadratic equation in standard form to solve for t.

$1 = -4.9t^2 + 3.5t + 10$ $\qquad$ $0 = -4.9t^2 + 3.5t + 9$

First, use the discriminant to find the number of real solutions of the equation.

$b^2 - 4ac$ $\qquad$ Use the discriminant.

$(3.5)^2 - 4(-4.9)(9) = 188.65$

Since $b^2 - 4ac > 0$, the equation has two real solutions.

H work # 10 and #12

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Solve using the quadratic formula. Leave irrational answers in radical form.

9. $10x + 4 = 6x^2$ → must set y=0 first

$0 = 6x^2 - 10x - 4$

$a = 6$
$b = -10$
$c = -4$

$x = \dfrac{-(-10) \pm \sqrt{(-10)^2 - 4(6)(-4)}}{2(6)}$

$x = \dfrac{10 \pm \sqrt{196}}{12}$

$x = \dfrac{10 \pm 14}{12}$

$\dfrac{10+14}{12}$ → 2

$\dfrac{10-14}{12}$ → $-1/3$

10. $x^2 + x - 20 = 0$

11. $4x^2 = 4 - x$

12. $9x^2 + 3x - 2 = 0$