$\qquad$ Class $\qquad$

## $\underset{\substack{\text { Lesson } \\ 3-1}}{ }$ Solving Quadratic Equations by Taking Square Roots

Practice and Problem Solving: A/B
For Problems 1-2, solve the equation $-2 x^{2}+7=-1$ using the indicated method. Show your work

1. Solve by factoring.
2. Solve by taking square roots.

Find the square of each imaginary number.
4. $4 i$
5. $i \sqrt{11}$
6. $\frac{i \sqrt{7}}{3}$

Determine whether each equation has real or imaginary solutions by solving.
7. $7 x^{2}-12=0$
8. $x^{2}+9=3$
9. $2\left(x^{2}-1\right)=\left(x^{2}-3\right)$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
Recall the equation for falling objects: $h(t)=h_{0}-16 t^{2}$, where $h$ is the height of the object, in feet, at any time $t$, in seconds, and $h_{0}$ is the object's initial height in feet. Use this equation for Problems 10-11.
10. A carpenter dropped a hammer from a rooftop 48 feet above ground.

How long did it take the hammer to hit the ground?
$\qquad$
11. An acorn fell from a branch 20 feet high and landed on a branch 7 feet high.

How long did it take the acorn to fall?
$\qquad$
$\qquad$ Class $\qquad$

## Unit 2 Quadratic Functions, Equations, and Relations MODULE 3 Quadratic Equations

## LESSON 3-1

## Practice and Problem Solving: A/B

1. $x=-2$ and $x=2$

2. factoring:

$$
\begin{aligned}
&-2 x^{2}+7=-1 \\
&-2 x^{2}+8=0 \\
&-2\left(x^{2}+4\right)=0 \\
&-2(x+2)(x-2)=0 \\
& x=-2 \text { or } x=2
\end{aligned}
$$

3. taking square roots:

$$
\begin{aligned}
-2 x^{2}+7 & =-1 \\
-2 x^{2} & =-8 \\
x^{2} & =4 \\
x & = \pm \sqrt{4} \\
x & = \pm 2
\end{aligned}
$$

4. -16
5. -11
6. $-\frac{7}{9}$
7. real solutions; $x= \pm 2 \sqrt{\frac{3}{7}}$
8. imaginary solutions; $x= \pm i \sqrt{6}$
9. imaginary solutions; $x= \pm i$
10. $\sqrt{3} \approx 1.7 \mathrm{sec}$
11. $\frac{\sqrt{13}}{4} \approx 0.9 \mathrm{sec}$
$\qquad$
$\qquad$
$\qquad$

## Practice and Problem Solving: C

1. $x=-4$ and $x=4$

2. factoring:

$$
\begin{aligned}
& \frac{1}{2} x^{2}-3=5 \\
& \frac{1}{2} x^{2}-8=0 \\
& \frac{1}{2}\left(x^{2}-16\right)=0 \\
& \frac{1}{2}(x+4)(x-4)=0 \\
& x=-4 \text { or } x=4
\end{aligned}
$$

3. taking square roots:

$$
\begin{aligned}
\frac{1}{2} x^{2}-3 & =5 \\
\frac{1}{2} x^{2} & =8 \\
x^{2} & =16 \\
x & = \pm \sqrt{16} \\
x & = \pm 4
\end{aligned}
$$

4. -441
5. -388
6. $-\frac{189}{25}$
7. imaginary solutions: $x= \pm 6 i \sqrt{3}$
8. real solutions: $x= \pm \sqrt{\frac{14}{5}}$
9. imaginary solutions: $x= \pm i \sqrt{5}$
