## Unit 3 Lesson 16: Solving Quadratics

### 1 Find the Perfect Squares (Warm up)

#### Student Task Statement

The expression $x^{2}+8x+16$ is equivalent to $\left(x+4\right)^{2}$. Which expressions are equivalent to $\left(x+n\right)^{2}$ for some number $n$?

1. $x^{2}+10x+25$
2. $x^{2}+10x+29$
3. $x^{2}−6x+8$
4. $x^{2}−6x+9$

### 2 Different Ways to Solve It (Optional)

#### Student Task Statement

Elena and Han solved the equation $x^{2}−6x+7=0$ in different ways.

Elena said, “First I added 2 to each side:

$x^{2}−6x+7+2=2$

So that tells me:

$\left(x−3\right)^{2}=2$

I can find the square roots of both sides:

$x−3=\pm \sqrt{2}$

Which is the same as:

$x=3\pm \sqrt{2}$

So the two solutions are $x=3+\sqrt{2}$ and $x=3−\sqrt{2}$.”

Han said, “I used the quadratic formula:

$x=\frac{-b\pm \sqrt{b^{2}−4⋅a⋅c}}{2⋅a}$

Since $x^{2}−6x+7=0$, that means $a=1$, $b=-6$, and $c=7$. I know:

$x=\frac{6\pm \sqrt{36−4⋅1⋅7}}{2⋅1}$

or

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

So:

$x=3\pm \frac{\sqrt{8}}{2}$

I think the solutions are $x=3+\frac{\sqrt{8}}{2}$ and $x=3−\frac{\sqrt{8}}{2}$.”

Do you agree with either of them? Explain your reasoning.

### 3 Solve These Ones (Optional)

#### Student Task Statement

Solve each quadratic equation with the method of your choice. Be prepared to compare your approach with a partner‘s.

1. $x^{2}=100$
2. $x^{2}=38$
3. $x^{2}−10x+25=0$
4. $x^{2}+14x+40=0$
5. $x^{2}+14x+39=0$
6. $3x^{2}−5x−11=0$



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