## Unit 7 Lesson 13: Completing the Square (Part 2)

### 1 Math Talk: Equations with Fractions (Warm up)

#### Student Task Statement

Solve each equation mentally.

$x+x=\frac{1}{4}$

$(\frac{3}{2})^{2}=x$

$\frac{3}{5}+x=\frac{9}{5}$

$\frac{1}{12}+x=\frac{1}{4}$

### 2 Solving Some Harder Equations

#### Student Task Statement

Solve these equations by completing the square.

1. $(x−3)(x+1)=5$
2. $x^{2}+\frac{1}{2}x=\frac{3}{16}$
3. $x^{2}+3x+\frac{8}{4}=0$
4. $(7−x)(3−x)+3=0$
5. $x^{2}+1.6x+0.63=0$

### 3 Spot Those Errors!

#### Student Task Statement

Here are four equations, followed by worked solutions of the equations. Each solution has at least one error.

* Solve one or more of these equations by completing the square.
* Then, look at the worked solution of the same equation as the one you solved. Find and describe the error or errors in the worked solution.
1. $x^{2}+14x=-24$
2. $x^{2}−10x+16=0$
3. $x^{2}+2.4x=-0.8$
4. $x^{2}−\frac{6}{5}x+\frac{1}{5}=0$

Worked solutions (with errors):

1.

$\begin{matrix}x^{2}+14x&=-24\\x^{2}+14x+28&=4\\(x+7)^{2}&=4\\&\\x+7=2 &or x+7=-2\\x=-5 &or x=-9\end{matrix}$

2.

$\begin{matrix}x^{2}−10x+16&=0\\x^{2}−10x+25&=9\\(x−5)^{2}&=9\\&\\x−5=9 &or x−5=-9\\x=14 &or x=-4\end{matrix}$

3.

$\begin{matrix}x^{2}+2.4x&=-0.8\\x^{2}+2.4x+1.44&=0.64\\(x+1.2)^{2}&=0.64\\x+1.2&=0.8\\x&=-0.4\end{matrix}$

4.

$\begin{matrix}x^{2}−\frac{6}{5}x+\frac{1}{5}&=0\\x^{2}−\frac{6}{5}x+\frac{9}{25}&=\frac{9}{25}\\\left(x−\frac{3}{5}\right)^{2}&=\frac{9}{25}\\&\\x−\frac{3}{5}=\frac{3}{5} &or x−\frac{3}{5}=-\frac{3}{5}\\x=\frac{6}{5} &or x=0\end{matrix}$



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