

What questions do you have on your "Solving Quadratics by Completing the Square" worksheet? We will finish up the last part of it, so get it out!

$$\begin{array}{r}
 \textcircled{5} \quad b^2 - 14b + 35 = -7 \\
 \hline
 b^2 - 14b + 49 = -42 + 49
 \end{array}
 \quad \left(\frac{-14}{2}\right)^2 = (-7)^2 = 49$$

$$\begin{array}{r}
 b^2 - 14b + 49 = 7 \\
 \leftarrow (b-7)(b-7) \rightarrow (b-7)^2 = 7 \\
 (b-7)^2 - 7 = 0 \\
 \begin{array}{r}
 +7 \quad +7 \\
 \hline
 \sqrt{(b-7)^2} = \sqrt{7}
 \end{array} \\
 b-7 = \pm \sqrt{7} \\
 \begin{array}{r}
 +7 \quad +7 \\
 \hline
 \boxed{b = 7 \pm \sqrt{7}}
 \end{array}
 \end{array}$$

We need to solve these equations from our completing the square worksheet, using our equation solving skills to get our variable isolated on one side of the equals sign.

$$1) p^2 + 20p - 1 = 0$$

$$\left(\frac{b}{a}\right)^2 \rightarrow \left(\frac{20}{2}\right)^2 =$$

$$(10)^2 = 100$$

$$\begin{array}{r} p^2 + 20p + 100 = 1 + 100 \\ \hline \end{array}$$

$$p^2 + 20p + 100 = 101$$

$$(p+10)^2 = 101$$

$$(p+10)^2 - 101 = 0$$

$$\sqrt{(p+10)^2} = \sqrt{101}$$

$$p+10 = \pm \sqrt{101}$$

$$p = -10 \pm \sqrt{101}$$

$$\text{OR } \pm \sqrt{101} - 10$$

$$13) 5r^2 - 20r - 73 = -9$$

$$\begin{array}{r} +73 \\ +73 \end{array}$$

$$\hline 5r^2 - 20r = 64$$

$$5(r^2 - 4r + 4) = 64 + 20$$

$$5(r^2 - 4r + 4) = 84$$

$$5(r-2)^2 = 84$$

$$5(r-2)^2 - 84 = 0$$

$$\begin{array}{r} +84 \\ +84 \end{array}$$

$$\hline 5(r-2)^2 = 84$$

$$\sqrt{\frac{5(r-2)^2}{5}} = \sqrt{\frac{84}{5}}$$

$$r-2 = \pm \sqrt{\frac{84}{5}}$$

$$\begin{array}{r} +2 \\ +2 \end{array}$$

$$r = 2 \pm \sqrt{\frac{84}{5}} = 2 \pm \frac{\sqrt{4} \cdot \sqrt{21}}{\sqrt{5}}$$

$$\boxed{r = 2 \pm 2\sqrt{\frac{21}{5}}}$$

$$\left(-\frac{4}{2}\right)^2 = \frac{(-2)^2}{4}$$

To solve quadratics by taking square roots, you use your equation-solving skills, using PEMDAS backwards.

From your worksheet.

Solve each equation by taking square roots.

$$4) \sqrt{a^2} = \sqrt{39}$$

$$a = \pm \sqrt{39} \quad \text{or} \quad a = \sqrt{39}, -\sqrt{39}$$

$$10) 2n^2 - 6 = -22$$

$$\frac{\cancel{2n^2} - \cancel{6}}{\cancel{2}} = \frac{-22}{\cancel{2}}$$

$$n^2 = -16$$

$$\sqrt{n^2} = \sqrt{-8}$$

$$n = \pm \sqrt{-8} = \sqrt{-1} \cdot \sqrt{4} \cdot \sqrt{2}$$

$$i = \sqrt{-1}$$

$$n = \pm 2i\sqrt{2}$$

Solve each equation by taking square roots.

$$16) 49x^2 + 8 = 9$$

$$\begin{array}{r} -8 \quad -8 \\ \hline \end{array}$$

$$\frac{49x^2}{49} = \frac{1}{49}$$

$$\sqrt{x^2} = \sqrt{\frac{1}{49}}$$

$$x = \pm \frac{\sqrt{1}}{\sqrt{49}} = \boxed{\pm \frac{1}{7} = x}$$

$$20) 25x^2 - 2 = 7$$

$$\begin{array}{r} +2 \quad +2 \\ \hline \end{array}$$

$$\frac{25x^2}{25} = \frac{9}{25}$$

$$\sqrt{x^2} = \sqrt{\frac{9}{25}} = \pm \frac{\sqrt{9}}{\sqrt{25}}$$

$$\boxed{x = \pm \frac{3}{5}}$$

Homework

Solving Quadratics by Taking Square Roots WKS