Math in Living C O L O R !!

2.02 Quadratic Equations by Factoring

Intermediate Algebra: One Step at a Time. **Page 143 - 154 #21, 49, Extra Problem**

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To see Section 2.02 with explanations, examples, and exercises, coming soon!

To see explanation from Basic Algebra, coming soon!

P. 146. # 21. $x(2x+7)=-5$

$2x^2+7x+5=0$

Notice that this is really just a TRINOMIAL, and as such, it can be factored into the product of two binomials. In this case, the FIRST times FIRST gives you $2x^2$ which is $2x \bullet x$.

$(2x\_\_\_\_)(x\_\_\_\_)=0$

Next, the LAST times LAST must give you $+5$, so try $5 \bullet 1$ or $1 \bullet 5$, where the numbers are the SAME sign. In order for the numbers to add and give you a $+7x$ you will need to put the 5 in the first binomial and the 1 in the second binomial. Then the OUTER times OUTER will be $+2x$, and the INNER times INNER will be $+5x$ for a total of $+7x$. It looks like this:

$(2x+5)(x+1)=0$

Now, set each factor equal to zero, and solve for x. There are two solutions:

$(2x+5)=0$ or $(x+1)=0$

$2x=-5$ $\qquad$ $x=-1$

$x=-\frac{5}{2}$

P. 149: #49. $(x-4)^2 = 2x$

Solution: The first step in solving this equation is to square the binomial—i.e., remove the parentheses:

$$(x-4)(x-4) = 2x$$

$$x^2 - 8x + 16 = 2x$$

The next step is to set the equation equal to zero, by subtracting $2x$ from each side:

$$x^2 - 8x + 16 = 2x$$
$$\underline{\quad -2x \qquad -2x}$$

$$x^2 - 10x + 16 = 0$$

Notice that this is a trinomial which factors:

$$(x - \_\_\_)(x - \_\_\_)$$

$$(x - 8)(x - 2) = 0$$

Therefore, $x = 8, \quad x = 2$

No Extra Charge: $(x-4)^2 = 32-2x$

Solution: The first step in solving this equation is to square the binomial—i.e., remove the parentheses:

$$(x-4)(x-4) = 32-2x$$

$$x^2-8x+16 = 32-2x$$

The next step is to set the equation equal to zero, by subtracting 32 and adding $+2x$ from each side:

$$\begin{array}{rl} x^2-8x+16 & = 32-2x \\ +2x-32 & \quad -32+2x \end{array}$$

$$x^2-6x-16 = 0$$

Notice that this is a trinomial which factors:

$$(x-8)(x+2) = 0$$

Therefore, $x = 8,\ x = -2$.