KEY

Unit 7 Day 11 Notes on the Zero Product Property

What is the zero product property?

If $a \cdot b = 0$, then $a = 0$ or $b = 0$

So..... $(x+1)(x-1)=0$ means that $(x+1)=0$ OR $(x-1)=0$

$\boxed{x=-1}$ OR $\boxed{x=1}$

What is it used for?

Solving equations in factored form

When is it used?

When you have an equation that looks similar to $(\quad)(\quad)=0$

Already in factored form!

Ex 1) $(8v-7)(v+1)=0$

$8v-7=0$ OR $v+1=0$

$8v=7$

$\boxed{v=\frac{7}{8}}$ OR $\boxed{v=-1}$

Factor first!

Ex 2) $a^2-3a-28=0$

$(a-7)(a+4)=0$

$a-7=0$ OR $a+4=0$

$\boxed{a=7}$ OR $\boxed{a=-4}$

Ex 3) $v^2-4v+4=0$

$(v-2)(v-2)=0$

same factor!

$v-2=0$ $\boxed{v=2}$

Ex 4) $10b^2+76b+96=0$

$2(5b^2+38b+48)=0$

$2(5b+8)(b+6)=0$

$5b+8=0$ $b+6=0$

$5b=-8$ $\boxed{b=-6}$

$\boxed{b=-\frac{8}{5}}$ OR

You try:

1) $56m^2+288m+47=7$ *set equal to 0 first!

$56m^2+288m+40=0$

$8(7m^2+36m+5)=0$

$8(7m+1)(m+5)=0$

$7m+1=0$ $m+5=0$

$7m=-1$

$\boxed{m=-\frac{1}{7}}$ OR $\boxed{m=-5}$

2) $5p^2-2=3p$

$5p^2-3p-2=0$

$(5p+2)(p-1)=0$

$5p+2=0$ $p-1=0$

$5p=-2$

$\boxed{p=-\frac{2}{5}}$ OR $\boxed{p=1}$

Reverse! Reverse!
Write a polynomial equation in standard form and integer coefficient that has the following solutions.

1) $x = 2, x = \frac{2}{3}$

$(x-2)(3x-2)=0$

$3x^2-2x-6x+4=0$

$\boxed{3x^2-8x+4=0}$

2) $x = -\frac{5}{2}, x = 0$

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

$\boxed{2x^2+5x=0}$

Applications …

1) The area of a rectangular rug is 84 square feet. The length of the rug is 5 feet more than the width. Find the dimensions of the rug.

$l \cdot w = A$

$w(w+5) = 84$

$w^2+5 = 84$

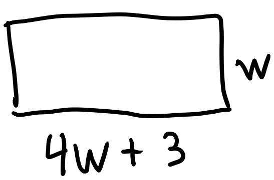
$w^2+5-84=0$

$(w+12)(w-7)=0$

$w = \cancel{-12}$ OR $\underline{\underline{7}}$

$\boxed{\begin{array}{l}\text{width} = 7 \text{ ft} \\ \text{length} = 12 \text{ ft}\end{array}}$

2) The area of a rectangular slab of sidewalk is 45 square feet. Its length is 3 feet more than four times its width. Find the length and width of the slab.



$w(4w+3)=45$

$4w^2+3w-45=0$

$(4w+15)(w-3)=0$

$w = \cancel{\frac{-15}{4}}$ OR $w = 3$

$\boxed{\begin{array}{l}\text{width} = 3 \text{ ft.} \\ \text{length} = 15 \text{ ft.}\end{array}}$