GSE Algebra 1 **8.2 – solve by factoring Notes** Name: _____

Factor to put standard form into intercept form.

Then, find what the two intercepts would be. This is **Solving by Factoring**.

Factor the following. Warmup

1) $x^2 + 9x + 20$	2) $14b^2 - 31b + 15$	3) $x^2 + 5x - 6$

Standard: $ax^2+bx+c=0$

Now, let's solve for x. Each equation MUST be set = 0. If it is not set = 0, then you must make it.

Solve by factoring

4) $(6r - 1)(r + 5) = 0$

$6r-1=0$ $r+5=0$

$+1\ +1$ $-5\ -5$

$\frac{6r}{6}=\frac{1}{6}$ $r=-5$

$r=\frac{1}{6}$

X-interepts

5) $(p + 1)(p + 6) = 0$

$p=-1$

$p=-6$

6) $x^2 + 5x - 6 = 0$

$(x+6)(x-1)=0$

$x+6=0$ $x-1=0$

$x=-6$ $x=1$

7) $2k^2 - 14 = -3k$

$+3k\ +3k$

$2k^2+3k-14=0$

-28

$-4\ 7$

	k	-2
$2k$	$2k^2$	$-4k$
7	$7k$	-14

$(2k+7)(k-2)=0$

$2k+7=0$ $k-2=0$

$-7\ -7$ $+2\ +2$

$\frac{2k}{2}=\frac{-7}{2}$ $k=2$

$k=-\frac{7}{2}$

8) $2n^2 + 11n - 21 = 0$

-42

$-14+3=11$

$-3+14=11$

	$2x$	-3
$1x$	$2x^2$	$-3x$
7	$14x$	-21

$(2x-3)(x+7)=0$

$2x-3=0$ $x+7=0$

$+3\ +3$ $-7\ -7$

$\frac{2x}{2}=\frac{3}{2}$ $x=-7$

$x=\frac{3}{2}$

9) $x^2 = 11x - 28$

$-11x+28\ -11x+28$

$x^2-11x+28=0$

28

$-4-7$

	x	-4
x	x^2	$-4x$
-7	$-7x$	28

$(x-4)(x-7)=0$

$x=4$ $x=7$

$x-4=0$ $x-7=0$

* Solve when = 0

These look a little different. We need to find a **GCF** (greatest common factor). → a # OR letter in common

Factor – these are special cases. Some you will have to solve.

$\frac{k^2}{k} - \frac{4k}{k}$ $k(k-4)$ GCF	$\frac{4x^2}{4x} - \frac{16x}{4x}$ $4x(x-4)$ GCF	$\frac{10x^2}{5x} + \frac{15x}{5x} = 0$ $(5x)(2x+3)=0$ $\frac{5x}{5} = \frac{0}{5}$ $x=0$ $2x+3=0$ $-3 \quad -3$ $\frac{2x}{2} = \frac{-3}{2}$ $x = \frac{-3}{2}$
$\frac{x^3}{x^2} - \frac{4x^2}{x^2}$ $x^2(x-4)$ GCF b=0	$\frac{6x^2}{6x} - \frac{36x}{6x} = 0$ $(6x)(x-6)=0$ $\frac{6x}{6} = \frac{0}{6}$ $x=0$ $x-6=0$ $+6 \quad +6$ $x=6$	$\frac{x^3}{x^2} + \frac{10x^2}{x^2}$ $x^2(x+10)$ GCF
$x^2 - 64$ $x \; x \; -8 \; 8$ $(x-8)(x+8)$ * Difference of squares (-) perfect √ *has to be −	$x^2 - 16$ $x \; x \; 4 \; -4$ $(x-4)(x+4)$	$x^2 - 81$ $x \; x \; -9 \; 9$ $(x+9)(x-9)$
$4x^2 - 1$ $2x \; 2x \; -1 \; 1$ $(2x-1)(2x+1)$	$36x^2 - 49$ $6x \; 6x \; 7 \; -7$ $(6x-7)(6x+7)$	$100x^2 + 9$ Can't Do it Not a difference of squares
$\frac{3x^2}{3} - \frac{300}{3} = 0$ $3(x^2-100)=0$ $x \; x \; 10 \; -10$ $3(x+10)(x-10)=0$ $3(x+10)=0$ $\frac{3x}{3} = \frac{-30}{3}$ $x=-10$ $x-10=0$ $x=10$	$\frac{5x^2}{5} = \frac{5}{5}$ $-5 \quad -5$ $\frac{5x^2}{5} - \frac{5}{5} = 0$ $5(x^2-1)=0$ $x \; x \; -1 \; 1$ $5(x-1)(x+1)=0$ $x-1=0$ $x=1$ $x+1=0$ $x=-1$	$\frac{16x^2}{4} - \frac{4}{4}$ $4(4x^2-1)$ $2x \; 2x \; -1 \; 1$ $4(2x-1)(2x+1)$

Finish whatever we don't get to for homework ☺

$4x^2 - 9$
 $(2x+3)(2x-3)$

$\frac{2x^2}{2} + \frac{4x}{2} + \frac{2}{2}$
 $2(x^2+2x+1)$