OPENING

Factor

$$9x^2 - 15x - 6$$

$\boxed{GCF}$ 3

$$3\left(\underset{a}{3}x^2 \underset{b}{-5}x \underset{c}{-2}\right)$$

$$3(3x+1)(1x-2)$$

P	S
$a \cdot c = -6$	$b = -5$
$-1 \cdot 6$	-5
$1 \cdot -6$	

$\left(\dfrac{1}{3}\right)$ $\dfrac{-6}{3} = \dfrac{-2}{1}$

Solving Quadratic Equations Using Factoring

1. Put all terms on one side of the equation; set the quadratic equal to zero.
2. Factor.
3. Use the (Zero Product Property), set all factors equal to zero.
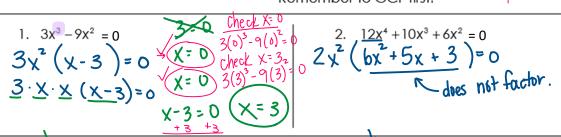4. Check your answers!!!

→ If $a \cdot b = 0$, then either $a = 0$ OR $b = 0$.

$5(3 \cdot 3) = 0$

$5 \cdot x = 0$ $5(x-3) = 0$

$5 \cdot x = 0$ $5(x-3) = 0$
                   ↑ $x - 3 = 0$
                   $\boxed{x = 3}$

Solve by factoring each equation.   Remember to GCF first!

1. $3x^3 - 9x^2 = 0$

$3x^2(x-3) = 0$
$3 \cdot x \cdot x (x-3) = 0$

$3 \cdot 0$ $x = 0$
$x = 0$
$x - 3 = 0$ $\boxed{x = 3}$
$+3$ $+3$

Check $x = 0$
$3(0)^3 - 9(0)^2 = 0$
check $x = 3$
$3(3)^3 - 9(3)^3 = 0$

2. $12x^4 + 10x^3 + 6x^2 = 0$

$2x^2(6x^2 + 5x + 3) = 0$
↘ does not factor.

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3. $x^2 + 9x + 20 = 0$

P	S
$a \cdot c$	b
20	9
$5 \cdot 4 = 9$	

$\dfrac{5}{1}$ $\dfrac{4}{1}$

$(x+5)(x+4) = 0$

$x + 5 = 0$ $x + 4 = 0$
-5 -5 -4 -4
$\boxed{x = -5}$ $\boxed{x = -4}$

4. $x^2 + 7x - 30 = 0$

P	S
$a \cdot c : -30$	$b : 7$
$-3 \cdot 10$	-3 10

$\dfrac{-3}{1}$ $\dfrac{10}{1}$

$(x-3)(x+10) = 0$

$x - 3 = 0$ $x + 10 = 0$
$\boxed{x = 3}$ $\boxed{x = -10}$

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5. $\boxed{x^2} = 49$

P	S
$a \cdot c$	b
-49	0
$7 \cdot -7$	

-49 -49

$\boxed{x^2 - 49} = 0$

$ax^2 + bx + c$
Difference of Squares

$x^2 + 0x - 49 = 0$

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

$x + 7 = 0$ $\boxed{x = -7}$
$x - 7 = 0$ $\boxed{x = 7}$

$(x-7)^2$
$(x-7)(x-7)$

6. $\boxed{x^2} = 10x - 24$

$-10x$ $-10x + 24$
$+24$

$x^2 - 10x + 24 = 0$
$(x-6)(x-4) = 0$

$x - 6 = 0$ $x - 4 = 0$
$\boxed{x = 6}$ $\boxed{x = 4}$

P	S
$a \cdot c = 24$	$b = -10$
$-6 \cdot -4$	

$\dfrac{-6}{1}$ $\dfrac{-4}{1}$