

<p>Both GCF and Split the middle term</p>	$4x^2 - 2x - 20$	$-3x^2 + 12x + 15$
<p>Special Cases</p> <p>Difference of squares</p> $a^2 - b^2$ $(a-b)(a+b)$	$x^2 - 25$ $(x-5)(x+5)$	$x^2 - 49$ $(x+7)(x-7)$
	$8x^2 - 28x - 60$	$12x^2 + 10x - 8$
	$112x^2 - 168x + 63$	$9x^2 - 1$ $(3x-1)(3x+1)$

Solving

1st factor

2nd Set linear factors equal to zero

3rd Solve each linear equation

$$a \cdot b = 0$$

$$(-1)^2 - 3(-1) - 4$$

$$1 + 3 - 4$$

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

$$(x-4)(x+1) = 0$$

$$x-4=0 \quad x+1=0$$

$$x=4 \quad x=-1$$

$$x^2 + 2x - 35 = 0$$

$$(x-5)(x+7) = 0$$

$$x-5=0 \quad x+7=0$$

$$x=5 \quad x=-7$$

$$5x^2 - 13x + 6 = 0$$

$$(5x^2 - 10x) + (3x + 6) = 0$$

$$5x(x-2) - 3(x-2) = 0$$

$$(5x-3)(x-2) = 0$$

$$5x-3=0 \quad x-2=0$$

$$5x=3 \quad x=2$$

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

$$\frac{-3x^2 + 3x + 90 = 0}{-3 \quad -3}$$

$$x^2 - x - 30 = 0$$

$$(x-6)(x+5) = 0$$

$$x=6 \quad x=-5$$

$$5x^2 - 25 = 4x^2 + 24$$

$$x^2 - 25 = 24$$

$$x^2 - 49 = 0$$

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

$$x=7 \quad x=-7$$

$$x = \pm 7$$

$$8x^2 - 6x - 5 = 0$$

$$(4x-5)(2x+1) = 0$$

$$4x-5=0 \quad 2x+1=0$$

$$x = \frac{5}{4} \quad x = -\frac{1}{2}$$

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

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

$$x=0 \quad x+7=0$$

$$x = -7$$

$$2x^2 + 4x - 1 = 7x^2 - 7x + 1$$

$$0 = 5x^2 - 11x + 2$$

$$= (5x-1)(x-2)$$

$$5x-1=0 \quad x-2=0$$

$$5x=1 \quad x=2$$

$$x = \frac{1}{5}$$

$$16x^2 = 8x - 1$$

$$16x^2 - 8x + 1 = 0$$

$$(16x^2 - 4x)(-4x + 1) = 0$$

$$4x(4x-1) - 1(4x-1)$$

$$(4x-1)(4x-1) = 0$$

$$x = \frac{1}{4}$$

$$\frac{6x^2 - 10x - 4}{2} = \frac{0}{2}$$

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

$$(3x+1)(x-2) = 0$$

$$3x+1=0 \quad x-2=0$$

$$x = -\frac{1}{3} \quad x = 2$$

Solve by taking the Square Root

1. Solve each quadratic by taking the square root.

a. $x^2 = 25$

b. $x^2 = 12$

c. $5x^2 = 75$

d. $5x^2 + 8 = 8$

e. $5x^2 + 15 = 60$

f. $5x^2 + 75 = 60$

g. $-5x^2 + 75 = 60$

$$\frac{-2x}{-2} = \frac{0}{-2}$$

$$x = 0$$

2. Solve by factoring

a. $0 = x^2 + 4x$
 $0 = x(x+4)$
 $x = 0 \quad x = -4$

b. $0 = 3x^2 + 10x$
 $x(3x+10)$
 $x = 0 \quad 3x+10=0$
 $x = -10/3$

c. $-x^2 - 5x = 0$
 $-x(x+5) = 0$
 $x = 0 \quad x = -5$

d. $-2x^2 + 6x = 0$
 $-2x(x-3) = 0$
 $x = 0 \quad x = 3$

e. $x^2 - 7x + 10 = 0$
 $(x-5)(x-2) = 0$
 $x = 5 \quad x = 2$

f. $x^2 + 12x + 32 = 0$
 $(x+4)(x+8) = 0$
 $x = -4 \quad x = -8$

g. $\frac{2x^2 - 18x - 72}{2} = 0$

$$x^2 - 9x - 36 = 0$$

$$(x-12)(x+3) = 0$$

$$x = 12 \quad x = -3$$

h. $x^2 + 5x = 6$
 $x^2 + 5x - 6 = 0$
 $(x+6)(x-1) = 0$
 $x = -6 \quad x = 1$

$$j. x^2 - 81 = 0$$

$$(x+9)(x-9) = 0$$

$$x = \pm 9$$

$$k. \frac{3x^2 - 27}{3} = 0$$

$$x^2 - 9 = 0$$

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

$$x = \pm 3$$

$$l. 16x^2 - 121 = 0$$

$$(4x+11)(4x-11) = 0$$

$$x = \pm \frac{11}{4}$$

$$\begin{aligned} & 3x^2 - 5x - 2 \\ & (3x^2 - 6x) + (x - 2) \\ & 3x(x - 2) + 1(x - 2) \\ & (3x + 1)(x - 2) \end{aligned}$$

$\frac{-6}{-6 \cdot 1}$