What you will learn about:
Solving Quadratics by Square Roots

Solve: $\sqrt{x^2} = \sqrt{81}$.

$x = \pm 9$

Solve: $\sqrt{y^2} = \sqrt{121}$.

$y = \pm 11$

Solve: $x^2 - 50 = 0$.

$\sqrt{x^2} = \sqrt{50}$

$x = \pm\sqrt{50}$

$= \pm 5\sqrt{2}$

Solve: $y^2 - 27 = 0$.

$y^2 = 27$

$y = \pm\sqrt{27}$

$= \pm 3\sqrt{3}$

Solve: $c^2 + 12 = 0$

$c^2 = -12$

$c = \pm\sqrt{-12}$ No Real Solution

Solve: $d^2 + 81 = 0$

$d^2 = -81$

$d = \pm\sqrt{-81}$ No Real Solution

Solve: $\frac{2x^2}{2} = \frac{98}{2}$

$x^2 = 49$

$x = \pm 7$

Solve: $\frac{3z^2}{3} = \frac{108}{3}$

$z^2 = 36$

$z = \pm 6$

Solve: $\frac{2}{3}u^2 + 5 = 17$

$-5 \quad -5$

$\frac{3}{2}\left(\frac{2}{3}\right)u^2 = (12)\frac{3}{2}$

$u^2 = 18$

$u = \pm 3\sqrt{2}$

Solve: $\frac{1}{2}x^2 + 4 = 24$

$\frac{1}{2}x^2 = 20$

$x^2 = 40$

$x = \pm\sqrt{40} = \pm 2\sqrt{10}$

Solve: $\frac{3}{4}y^2 - 3 = 18$

$\frac{4}{3}\left(\frac{3}{4}\right)y^2 = (21)\frac{4}{3}$

$y^2 = 28$

$y = \pm\sqrt{28}$

$\pm 2\sqrt{7}$

Solve: $5r^2 - 2 = 34$

$5r^2 = 36$

$\sqrt{r^2} = \sqrt{\frac{36}{5}}$

$r = \pm \frac{6}{\sqrt{5}} \frac{\sqrt{5}}{\sqrt{5}}$

$\pm \frac{6\sqrt{5}}{5}$

Solve: $3t^2 + 6 = 70$

$-6 \quad -6$

$3t^2 = 64$

$t^2 = \frac{64}{3}$

$t = \pm \frac{8}{\sqrt{3}}$

$= \pm \frac{8\sqrt{3}}{3}$

Solve: $\sqrt{(q+5)^2} = \sqrt{1}$

$q + 5 = \pm 1$

$q = -4, -6$

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

Solve: $\sqrt{(r-3)^2} = \sqrt{25}$

$r - 3 = \pm 5$

$r = 3 \pm 5$

$3+5 = 8$

$3-5 = -2$

Solve: $(a-3)^2 = 18$ $3 \pm 3\sqrt{2}$

$a - 3 = \pm\sqrt{18}$

$a = 3 \pm \sqrt{18}$

Solve: $(b+2)^2 = 40$ $-2 \pm 2\sqrt{10}$

$b + 2 = \pm\sqrt{40}$

$b = -2 \pm \sqrt{40}$

Solve: $\sqrt{\left(x - \frac{1}{2}\right)^2} = \sqrt{\frac{5}{4}}$

$x - \frac{1}{2} = \pm\frac{\sqrt{5}}{2}$

$x = \frac{1}{2} \pm \frac{\sqrt{5}}{2} \rightarrow \frac{1 \pm \sqrt{5}}{2}$

Solve: $\left(x - \frac{1}{3}\right)^2 = \frac{5}{9}$

$x - \frac{1}{3} = \pm\frac{\sqrt{5}}{3}$

$x = \frac{1}{3} \pm \frac{\sqrt{5}}{3}$

Solve: $\left(y - \frac{3}{4}\right)^2 = \frac{7}{16}$

$y - \frac{3}{4} = \pm\frac{\sqrt{7}}{4}$

$y = \frac{3}{4} \pm \frac{\sqrt{7}}{4}$

	Solve: $(x-2)^2+3=30$ $(x-2)^2=27$ $x-2=\pm\sqrt{27}$ $x=2\pm3\sqrt{3}$ Solve: $(a-5)^2+4=24$ $(a-5)^2=20$ $a-5=\pm\sqrt{20}$ $a=5\pm2\sqrt{5}$ Solve: $(b-3)^2-8=24$ $(b-3)^2=32$ $b-3=\pm\sqrt{32}$ $b=3\pm4\sqrt{2}$ Solve: $(3r+4)^2=-8$ $3r+4=\pm\sqrt{-8}$ No Real Solution
$p^2-10p+7=0$	Solve: $p^2-10p+25=18$ $(p-5)^2=18$ $p-5=\pm\sqrt{18}$ $p=5\pm3\sqrt{2}$

Solve: $x^2 - 6x + 9 = 12$

$(x-3)^2 = 12$

$x-3 = \pm\sqrt{12}$

$x = 3 \pm 2\sqrt{3}$

Solve: $y^2 + 12y + 36 = 32$

$(y+6)^2 = 32$

$y+6 = \pm\sqrt{32}$

$y = -6 \pm 4\sqrt{2}$

Solve: $y^2 + 12y + 36 = 32$

What you will learn about:
Solving Quadratics by Completing the Square

ax^2+bx+c

Complete the Square

1) $a=1$

2) b-value and divide by 2

3) Square answer in step # 2

$\frac{9}{2}$

Complete the square to make it a perfect square trinomial. Write as a binomial squared.

$x^2+14x+49$

$(x+7)^2$

$y^2+12y+36$

$(y+6)^2$

$a^2-20a+100$

$(a-10)^2$

b^2-4b+4

$(b-2)^2$

$u^2-9u+\frac{81}{4}$

$\left(u-\frac{9}{2}\right)^2$

$m^2-5m+\frac{25}{4}$

$\left(m-\frac{5}{2}\right)^2$

$p^2+\frac{1}{2}p+\frac{1}{16}$

$\left(p+\frac{1}{4}\right)^2$

$q^2-\frac{2}{3}q+\frac{1}{9}$

$\left(q-\frac{1}{3}\right)^2$

a = 1

Solve by Completing the Square

Solve $x^2 + 8x = 48$ by completing the square.

$x^2+8x+16 = 48+16$

$\sqrt{(x+4)^2} = \sqrt{64}$

$x+4 = \pm 8$

$x = -4 \pm 8$

$-4+8 \quad -4-8$

$4 \quad -12$

Solve $d^2 + 10d = -9$ by completing the square.

$d^2+10d+25 = -9+25$

$(d+5)^2 = 16$

$d+5 = \pm 4$

$d = -5 \pm 4$

$-5+4 \quad -5-4$

$-1 \quad -9$

Solve $y^2 - 6y = 16$ by completing the square.

$y^2-6y+9 = 16+9$

$(y-3)^2 = 25$

$y-3 = \pm 5$

$y = 3 \pm 5$

$3+5 = 8$

$3-5 = -2$

Solve $r^2 - 4r = 12$ by completing the square.

$r^2 - 4r + 4 = 12 + 4$

$(r-2)^2 = 16$

$r - 2 = \pm 4$

$r = 2 \pm 4$

$r = 6, -2$

Solve $x^2 + 4x = -21$ by completing the square.

$x^2 + 4x + 4 = -21 + 4$

$(x+2)^2 = -17$

No Real Solution

Solve $x^2 + 10x + 4 = 15$ by completing the square.

$x^2 + 10x + 25 = 11 + 25$

$(x+5)^2 = 36$

$x + 5 = \pm 6$

$x = -5 \pm 6$

$x = 1, -11$

$11 + \frac{9}{4}$

$\frac{44}{4} + \frac{9}{4} = \frac{53}{4}$

Solve $n^2 = 3n + 11$ by completing the square.

$n^2 - 3n + \frac{9}{4} = 11 + \frac{9}{4}$

$(n - \frac{3}{2})^2 = \frac{53}{4}$

$n - \frac{3}{2} = \pm \frac{\sqrt{53}}{2}$

$n = \frac{3}{2} \pm \frac{\sqrt{53}}{2}$