

Solving Quadratics Review EXAMPLES

Solve each equation by taking square roots.

1) $4p^2 + 6 = -32$

$$\frac{4p^2}{4} = \frac{-38}{4}$$

$$\sqrt{p^2} = \sqrt{\frac{-19}{2}}$$

$$p^2 = \frac{i\sqrt{19}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \boxed{\frac{i\sqrt{19}}{2}}$$

rationalize

- isolate the quadratic term
- take the square root of both sides.
- Simplify and rationalize the denominator if necessary.
- take out an i if necessary

Solve each equation by completing the square.

2) $r^2 - 6r - 60 = 9$

$$\frac{r^2 - 6r}{+60 +60} = \frac{69}{+60 +60}$$

$$r^2 - 6r = 69$$

$$b = -6 \quad 2$$

$$\left(\frac{-6}{2}\right)^2 = 9$$

$$r^2 - 6r + 9 = 69 + 9$$

$$(r-3)(r-3) = 78$$

$$\sqrt{(r-3)^2} = \sqrt{78}$$

$$r-3 = \pm\sqrt{78}$$

$$\boxed{r = 3 \pm \sqrt{78}}$$

Solve each equation by factoring.

3) $8n^2 + 48 = -56n$

• set = 0

$$8n^2 + 56n + 48 = 0$$

• factor

$$8(n^2 + 7n + 6) = 0$$

• set each factor = 0

$$8(n+6)(n+1) = 0$$

$$8 \neq 0 \quad n+6=0 \quad n+1=0$$

• solve

$$\boxed{n = -6} \quad \boxed{n = -1}$$

- isolate the constant
- add $\left(\frac{b}{a}\right)^2$ to both sides
- Factor the trinomial
- Solve by taking square roots

4) $14m^2 - 3m - 8 = -3$

* Mult a • C

 -70

$$14m^2 - 3m - 5 = 0$$

 $-10, 7$

$$14m^2 - 10m + 7m - 5 = 0$$

$$2m(7m-5) + 1(7m-5) = 0$$

$$(7m-5)(2m+1) = 0$$

$$7m-5=0$$

$$2m+1=0$$

$$7m=5$$

$$2m=-1$$

$$\boxed{m = \frac{5}{7}}$$

$$\boxed{m = -\frac{1}{2}}$$

Solve each equation with the quadratic formula.

Quadratic Formula:

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

set = 0
first

5) $5m^2 - 1 = -4m$

$$5m^2 + 4m - 1 = 0$$

$a = 5$

$b = 4$

$c = -1$

$$X = \frac{-4 \pm \sqrt{4^2 - 4(5)(-1)}}{2(5)}$$

$$X = \frac{-4 \pm \sqrt{16 + 20}}{10}$$

$$X = \frac{-4 \pm \sqrt{36}}{10}$$

$$X = \frac{-4 \pm 6}{10}$$

$$X = \frac{-4 + 6}{10}$$

$$X = \frac{-4 - 6}{10}$$

$$X = \frac{2}{10}$$

$$X = \frac{-10}{10}$$

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

$$X = -1$$

6) $7x^2 = 7x - 8$

$$7x^2 - 7x - 8 = 0$$

$a = 7$

$b = -7$

$c = -8$

$$X = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(7)(-8)}}{2(7)}$$

$$X = \frac{7 \pm \sqrt{49 + 224}}{14}$$

$$X = \frac{7 \pm \sqrt{273}}{14}$$

$$X = \frac{7}{14} \pm \frac{\sqrt{273}}{14}$$

$$X = \frac{1}{2} \pm \frac{\sqrt{273}}{14}$$