

HW - SOLVING BY QUADRATIC FORMULA AND SQUARE ROOTS

NAME key Spring 2017

Find the discriminant of each equations and then state the number and type of roots.

$$b^2 - 4ac$$

1. $7x^2 + 5x + 5 = 0$

2. $6x^2 + 9x - 6 = 0$

3. $9x^2 - 6x + 1 = 0$

4. $-x^2 + 9x = -10$

$-x^2 + 9x + 10 = 0$

$(9)^2 - 4(-1)(10)$

$(5)^2 - 4(7)(5)$

$(9)^2 - 4(6)(-6)$

$(-6)^2 - 4(9)(1)$

-115
2 imaginary

225
2 real

0
1 real

121
2 real

Solve each equation using the Quadratic Formula. Show all work. State the type of roots.

5. $8x^2 + 9x + 11 = 0$

$$x = \frac{-9 \pm \sqrt{(9)^2 - 4(8)(11)}}{2(8)}$$

$$x = \frac{-9 \pm \sqrt{-271}}{16}$$

$x = \frac{-9 \pm i\sqrt{271}}{16}$ 2 imaginary

6. $4x^2 - 20 = -12x$

$4x^2 + 12x - 20 = 0$

$$x = \frac{-12 \pm \sqrt{(12)^2 - 4(4)(-20)}}{2(4)}$$

$$x = \frac{-12 \pm \sqrt{464}}{8}$$

$x = \frac{-12 \pm 4\sqrt{29}}{8}$ reduce!

464
 $4 \cdot 116$
 $2 \cdot 2 \cdot 4 \cdot 29$
 $2 \cdot 29$

$x = \frac{-3 \pm \sqrt{29}}{2}$
two real irrational

7. $x^2 - 110 = -x$
 $x^2 + x - 110 = 0$

$$x = \frac{-1 \pm \sqrt{(1)^2 - 4(1)(-110)}}{2(1)}$$

$$x = \frac{-1 \pm \sqrt{441}}{2}$$

$x = \frac{-1+21}{2}$ $x = \frac{-1-21}{2}$

$x = 10$ $x = -11$
two real rational roots

$x = \frac{-1 \pm 21}{2}$ keep going!

8. $7x^2 + 2 = 0$

$$x = \frac{0 \pm \sqrt{0^2 - 4(7)(2)}}{2(7)}$$

$$x = \frac{0 \pm \sqrt{-56}}{14}$$

$$x = \frac{0 \pm 2i\sqrt{14}}{14}$$

reduce!
 $\frac{+i\sqrt{14}}{7}$
two imaginary roots

56
 $2 \cdot 28$
 $7 \cdot 4$
 $2 \cdot 2$

9. $6x^2 + 7x + 10 = 0$

$$x = \frac{-7 \pm \sqrt{(7)^2 - 4(6)(10)}}{2(6)}$$

$$x = \frac{-7 \pm \sqrt{-191}}{12}$$

$x = \frac{-7 \pm i\sqrt{191}}{12}$
two imaginary roots

10. $2x^2 - 93 = 5$

$2x^2 - 98 = 0$

$$x = \frac{0 \pm \sqrt{0^2 - 4(2)(-98)}}{2(2)}$$

$$x = \frac{0 \pm \sqrt{784}}{4}$$

$$x = \frac{\pm 28}{4}$$

$x = \pm 7$
two real rational roots

Solve each equation using square roots. State the type of solutions that exist.

11. $k^2 = -18$

$$k = \pm \sqrt{-18}$$
$$k = \pm i\sqrt{18}$$

$$\sqrt{18}$$
$$\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$$

$$k = \pm 3i\sqrt{2}$$

two imaginary roots

12. $-5x^2 = -500$

$$x^2 = 100$$

$$x = \pm \sqrt{100}$$

$$x = \pm 10$$

two real rational roots

13. $7x^2 - 532 = 0$

$$7x^2 = 532$$

$$x^2 = 76$$

$$x = \pm \sqrt{76}$$

$$\sqrt{76}$$
$$\begin{array}{r} 4 \\ \times 19 \\ \hline 76 \end{array}$$

$$x = \pm 2\sqrt{19}$$

two real irrational roots

14. $-2x^2 - 150 = 0$

$$-2x^2 = 150$$

$$x^2 = -75$$

$$x = \pm \sqrt{-75}$$

$$x = \pm i\sqrt{75}$$

$$x = \pm 5i\sqrt{3}$$

two imaginary roots

$$\sqrt{75}$$
$$\begin{array}{r} 5 \\ \times 15 \\ \hline 75 \end{array}$$

15. $7x^2 - 10 = 228$

$$7x^2 = 238$$

$$x^2 = 34$$

$$x = \pm \sqrt{34}$$

two real irrational roots

16. $x^2 + 1 = 0$

$$x^2 = -1$$

$$x = \pm \sqrt{-1}$$

$$x = \pm i$$

two imaginary roots