

HW AFTER QUIZ - MIXED REVIEW

NAME Key Spring  
2017

Solve each equation by factoring.

1.  $2x^2 + 3x - 20 = 0$

$(2x-5)(x+8) = 0$

$2x = 5$      $x = -8$

$x = 5/2$

2.  $x^3 - 16x = 0$

$x(x^2 - 16) = 0$

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

$x = 0$      $x = 4$      $x = -4$

Solve each equation by completing the square.

3.  $x^2 + 14x + 85 = 0$

$x^2 + 14x + 49 = -85 + 49$

$(x+7)^2 = -36$

$x+7 = \pm 6i$

$x = -7 \pm 6i$

4.  $6x^2 + 7x + 10 = 0$   $\div$  everything by 6  
 $x^2 + \frac{7}{6}x + \frac{49}{144} = -10 + \frac{49}{144}$

$(x + \frac{7}{12})^2 = \frac{-191}{144}$

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

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

Solve each equation using the quadratic formula.

5.  $4x^2 - 12x - 99 = -8$

$4x^2 - 12x - 91 = 0$

$x = \frac{12 \pm \sqrt{(-12)^2 - 4(4)(-91)}}{2(4)}$

$x = \frac{12 \pm \sqrt{1600}}{8}$

$x = \frac{12 \pm 40}{8}$

$x = 13/2$

$x = -7/2$

Solve each equation using square roots.

7.  $9x^2 = 252$

$x^2 = 28$

$x = \pm \sqrt{28}$   
 $\quad \quad \quad \uparrow$   
 $\quad \quad \quad 7 \cdot 4$

$(2 \cdot 2)$

$x = \pm 2\sqrt{7}$

6.  $6x^2 + 2x + 12 = 0$

$x = \frac{-2 \pm \sqrt{(2)^2 - 4(6)(12)}}{2(6)}$

$x = \frac{-2 \pm \sqrt{-284}}{12}$

$x = \frac{-2 \pm i\sqrt{284}}{12}$

$x = \frac{-2 \pm 2i\sqrt{71}}{12}$

$\div$  reduce

$x = \frac{-1 \pm i\sqrt{71}}{6}$

8.  $-2x^2 - 93 = 5$

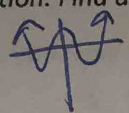
$-2x^2 = 98$

$x^2 = -49$

$x = \pm 7i$

Sketch a picture of each function. Find all roots. SHOW ALL WORK.

9.  $x^4 - 15x^2 + 54 = 0$



calc table:  $(-3, 0)$   
 $(3, 0)$

$$\begin{array}{r|rrrrr} -3 & 1 & 0 & -15 & 0 & 54 \\ + \downarrow & & -3 & 9 & 18 & -54 \\ \hline & 1 & -3 & -6 & 18 & 0 \end{array}$$

$$\begin{array}{r|rrrr} 3 & 1 & -3 & -6 & 18 \\ + \downarrow & & 3 & 0 & -18 \\ \hline & 1 & 0 & -6 & 0 \end{array}$$

$x^2 - 6 = 0$   
 $x^2 = 6$   
 $x = \pm\sqrt{6}$

Roots:  
 $x = -3, 3, \pm\sqrt{6}$

10.  $x^3 - 4x^2 + 8x = 0$



calc table:  $(0, 0)$

$$\begin{array}{r|rrrr} 0 & 1 & -4 & 8 & 0 \\ + \downarrow & & 0 & 0 & 0 \\ \hline & 1 & -4 & 8 & 0 \end{array}$$

$x^2 - 4x + 8 = 0$   
 $x^2 - 4x + 4 = -8 + 4$   
 $(x-2)^2 = -4$   
 $x-2 = \pm 2i$   
 $x = 2 \pm 2i$

Roots:  
 $x = 0, 2 \pm 2i$

11.  $x^3 - x^2 + x - 1 = 0$



calc table:  $(1, 0)$

$$\begin{array}{r|rrrr} 1 & 1 & -1 & 1 & -1 \\ + \downarrow & & 1 & 0 & 1 \\ \hline & 1 & 0 & 1 & 0 \end{array}$$

$x^2 + 1 = 0$   
 $x^2 = -1$   
 $x = \pm\sqrt{-1}$   
 $x = \pm i$

Roots:  
 $x = 1, \pm i$

12.  $x^3 + 4x^2 - 5x = 0$



calc table:  $(-5, 0)$   
 $(0, 0)$   
 $(1, 0)$

Roots:  
 $x = -5, 0, 1$