

# Algebra 2 Assignment 31

**NEW** p357

11.  $2x^2 = 72$   $x = \frac{0 \pm \sqrt{0 - 4(2)(-72)}}{2(2)} = x = \frac{\pm \sqrt{576}}{4} = \frac{\pm 24}{4}$   $x = 6, -6$   
 $2x^2 + 0x - 72 = 0$

13.  $x^2 + 15x + 10 = 0$   $x = \frac{-5 \pm \sqrt{25 - 4(1)(10)}}{2(1)} = \frac{-5 \pm \sqrt{-15}}{2} = \frac{-5 \pm i\sqrt{15}}{2}$

17.  $2x^2 - 12x + 18 = 0$   $x = \frac{12 \pm \sqrt{144 - 4(2)(18)}}{2(2)} = \frac{12 \pm \sqrt{144 - 144}}{4} = \frac{12}{4} = 3$

19.  $3x^2 + 5x - 2 = 0$   $x = \frac{-5 \pm \sqrt{25 - 4(3)(-2)}}{2(3)} = \frac{-5 \pm \sqrt{25 + 24}}{6} = \frac{-5 \pm \sqrt{49}}{6}$   
 $= \frac{-5 \pm 7}{6} \rightarrow \frac{-5+7}{6} = \frac{2}{6} = \frac{1}{3}$   $x = -2, \frac{1}{3}$   
 $\rightarrow \frac{-5-7}{6} = \frac{-12}{6} = -2$

21.  $3x^2 + 11x + 4 = 0$   $x = \frac{-11 \pm \sqrt{121 - 4(3)(4)}}{2(3)} = \frac{-11 \pm \sqrt{121 - 48}}{6} = \frac{-11 \pm \sqrt{73}}{6}$

23.  $x^2 = 6x$   $x = \frac{6 \pm \sqrt{36 - 4(1)(6)}}{2(1)} = \frac{6 \pm \sqrt{36}}{2} = \frac{6 \pm 6}{2}$   $\frac{6+6}{2} = 6$   $x = 0, 6$   
 $x^2 - 6x + 0 = 0$   $\frac{6-6}{2} = 0$

25.  $5x^2 - 8x + 9 = 0$   $x = \frac{8 \pm \sqrt{64 - 4(5)(9)}}{2(5)} = \frac{8 \pm \sqrt{64 - 180}}{10} = \frac{8 \pm \sqrt{-116}}{10}$   $\frac{116}{4} = 29$   
 $= \frac{8 \pm 2i\sqrt{29}}{10} = \frac{2(4 \pm i\sqrt{29})}{2(5)} = \frac{4 \pm i\sqrt{29}}{5}$

27.  $2x^2 - 13x = 7$   $x = \frac{13 \pm \sqrt{169 - 4(2)(-7)}}{2(2)} = \frac{13 \pm \sqrt{169 + 56}}{4} = \frac{13 \pm \sqrt{225}}{4}$   
 $2x^2 - 13x - 7 = 0$   $= \frac{13 \pm 15}{4} \rightarrow \frac{13+15}{4} = \frac{28}{4} = 7$   $x = -\frac{1}{2}, 7$   
 $\rightarrow \frac{13-15}{4} = \frac{-2}{4} = -\frac{1}{2}$

### Assignment 31-continued

29.  $4x^2 - 9x = -7$       $x = \frac{9 \pm \sqrt{81 - 4(4)(7)}}{2(4)} = \frac{9 \pm \sqrt{81 - 112}}{8} = \frac{9 \pm \sqrt{-31}}{8}$   
 $4x^2 - 9x + 7 = 0$

$$x = \frac{9 \pm i\sqrt{31}}{8}$$

### Packet

1.  $3x^2 - 5x - 2 = 0$

disc =  $(-5)^2 - 4(3)(-2) = 25 + 24 = 49$ ; 2 real, rational roots

2.  $x^2 + 7 = -5x \rightarrow x^2 + 5x + 7 = 0$

disc =  $(5)^2 - 4(1)(7) = 25 - 28 = -3$ ; 2 imaginary roots

3.  $4x^2 = -25 + 20x \rightarrow 4x^2 - 20x + 25 = 0$

disc =  $(-20)^2 - 4(4)(25) = 400 - 400 = 0$ ; 1 real, rational root

4.  $3x^2 + 9x - 2 = 0$

disc. =  $(9)^2 - 4(3)(-2) = 81 + 24 = 105$ ; 2 real, irrational roots

5.  $x^2 = 3x \rightarrow x^2 - 3x + 0 = 0$

disc. =  $(-3)^2 - 4(1)(0) = 9 - 0 = 9$ ; 2 real, rational roots

### REVIEW

6.  $x^8 y^{10} (x^{11} y^{-8} + x^{10} y^6) = x^{-8+11} y^{-8+10} + x^{-8+10} y^{10-6} = x^3 y^2 + x^2 y^4$

7.  $\frac{3}{(6-2i)(6+2i)} = \frac{18+6i}{36-4i^2} = \frac{18+6i}{40} = \frac{2(9+3i)}{2(20)} = \frac{9+3i}{20}$

8.  $\frac{(5+3i)(1-i)}{(1+i)(1-i)} = \frac{5-5i+3i-3i^2}{1-i^2-i^2+1} = \frac{8-2i}{2} = 4-i$

9.  $\frac{\sqrt{3x-5} - 3}{+3 +3} = 1$   
 $\sqrt{3x-5} = 4$   
 $3x-5 = 16$   
 $3x = 21$   
 $x = 7$

10.  $\frac{d + \sqrt{d^2 - 8}}{-d} = \frac{4}{-d}$   
 $\sqrt{d^2 - 8} = (4-d)^2$

$d^2 - 8 = 16 - 4d - 4d - d^2$   
 $d^2 - 16 = -16 - 8d - d^2$   
 $2d^2 - 24 = -8d$   
 $2d^2 + 8d - 24 = 0$   
 $(d^2 + 4d - 12) = 0$   
 $2(d+6)(d-2) = 0$

~~$d+6=0$~~   $d-2=0$   
 $-6-6$   $+2+2$   
 $d = -6, 2$   
 $\emptyset$

Assignment 31 - continued

11. Josh scored 25 points in the basketball game. He had twice as many 2 point baskets as 1 point free throws. How many baskets and free throws did he make?

$x = \# \text{ baskets}$ ,  $y = \# \text{ free throws}$

points:  $2x + 1y = 25$

#shots:  $x = 2y$        $2(2y) + y = 25$

$4y + y = 25$

$5y = 25$

$y = 5$

$x = 2(5)$

$x = 10$

He shot 10 two-point baskets, and 5 freethrows.

Solve using a calculator: Round to 3 decimals:

12.  $x^2 + 6x - 3 = 0$        $x = -6.464, .464$

13.  $12x^3 - 84x^2 + 120x = 0$        $x = 0, 2, 5$

14.  $5\sqrt{x} - \sqrt{x-1} = 6 \rightarrow 5\sqrt{x} - \sqrt{x-1} - 6 = 0$        $x = 1.944$

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16.  $d^2 - 5d = 0 \rightarrow d(d-5) = 0$        $d = 0, 5$

20.  $3c^2 = 5c \rightarrow 3c^2 - 5c = 0 \rightarrow c(3c-5) = 0$        $c = 0, \frac{5}{3}$

24.  $4x^2 - 13x = 12 \rightarrow 4x^2 - 13x - 12 = 0$        $(4x+3)(x-4) = 0$        $x = -\frac{3}{4}, 4$

26.  $4a^2 - 17a + 4 = 0$        $(4a-1)(a-4) = 0$        $a = \frac{1}{4}, 4$

32.  $x^3 = 64x \rightarrow x^3 - 64x = 0 \rightarrow x(x^2 - 64) = 0 \rightarrow x(x+8)(x-8) = 0$

$x = 0, -8, 8$

46.  $\frac{2}{3}(\frac{1}{2}a + 3b) + \frac{1}{2}(\frac{2}{3}a + b) = \frac{1}{3}a + 2b + \frac{1}{3}a + \frac{b}{2} = \frac{2}{3}a + \frac{5}{2}b$

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6.  $x^2 + 12x + c$        $c = (\frac{12}{2})^2 = 6^2 = 36$

8.  $x^2 + 8x + 16 = 20 + 16$        $(\frac{8}{2})^2 = 4^2 = 16$

$\sqrt{(x+4)^2} = \pm 36$

$x+4 = \pm 6 \rightarrow x = -4 \pm 6$        $x = -4+6$        $x = -4-6$

$-4 \quad -4$

$x = 2, x = -10$

## Assignment 31- continued

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10.  $r^2 + 14 = 8r$

$$\left(-\frac{8}{2}\right)^2 = (-4)^2 = 16$$

$$r^2 - 8r + 16 = -14 + 16$$

$$\sqrt{(r-4)^2} = \pm\sqrt{2}$$

$$r-4 = \pm\sqrt{2}$$

$$\rightarrow \boxed{r = 4 \pm \sqrt{2}}$$

18.  $r^2 - 9r + c$   $c = \left(-\frac{9}{2}\right)^2 = \frac{81}{4}$

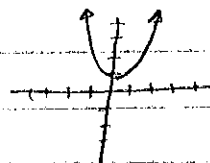
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22.  $2x^2 + 2x - 4 = 0$

$$\boxed{x = -2, 1}$$

32.  $g(x) = x^2 - \frac{2}{5}x + \frac{26}{25}$

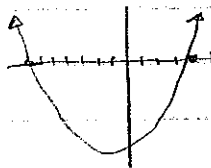
$$\text{vertex: } (.2, 1)$$



34.  $m^2 + 3m = 28$

$$\boxed{m = -7, 4}$$

$$m^2 + 3m - 28 = 0$$



36.  $4n^2 - 7n - 15 = 0$

$$\boxed{n = -1.25, 3}$$

