

# Semester Review 1 Solutions

1.  $6x^2 - 11x = 7$

$$6x^2 - 11x - 7 = 0$$

$$(3x-7)(2x+1) = 0$$

$$3x-7=0 \quad 2x+1=0$$

$x = \frac{7}{3}$	$x = -\frac{1}{2}$
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2.  $\frac{4x}{x-2} + \frac{3}{x} = \frac{-6}{x^2-2x} \quad x \neq 2, x \neq 0$

$$\frac{4x \cdot (x)}{x-2 \cdot (x)} + \frac{3(x-2)}{x(x-2)} = \frac{-6}{x(x-2)}$$

$$4x^2 + 3x - 6 = -6$$

$$4x^2 + 3x = 0$$

$$x(4x+3) = 0 \Rightarrow x=0 \text{ or } 4x+3=0$$

$x = -\frac{3}{4}$
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3.  $|4x+3| = 7$

$$4x+3 = 7 \quad 4x+3 = -7$$

$$4x = 4$$

$$4x = -10$$

$x = 1$	$x = \frac{-10}{4} = -\frac{5}{2}$
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4.  $3x^2 + 2x + 2 = 0$

$$D = b^2 - 4ac$$

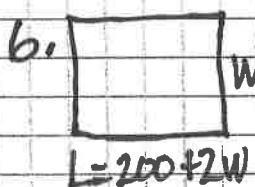
$$D = 2^2 - 4(3)(2) = -20$$

so 2 imag. sol'ns

5.  $9x^2 - 12x - 4 = 0$

$$D = (-12)^2 - 4(9)(-4)$$

= 288 so 2 IR sol'ns



$$W(200+2W) = 40,000$$

$$200W + 2W^2 = 40,000$$

$$W^2 + 100W - 20,000 = 0$$

$$(W+200)(W-100) = 0$$

$$W = -200 \quad W = 100$$

$L = 400 \text{ yd}$	$W = 100 \text{ yd}$
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7.

$A = 5000$
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$$P = 300 \text{ m}$$

$$L \cdot W = 5000$$

$$P = 2(L+W)$$

$$300 = 2(L+W)$$

$$150 = L+W$$

$$150 - L = W$$

$$L(150-L) = 5000$$

$$150L - L^2 = 5000$$

$$0 = L^2 - 150L + 5000$$

$$0 = (L-50)(L-100)$$

$L = 50$	$W = 100$
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# SEMESTER REVIEW 1 SOLUTIONS P. 2

8.  $\sqrt{3x+4} + 4 = 2x$

$\sqrt{3x+4} = 2x - 4$

$3x+4 = 4x^2 - 16x + 16$

$0 = 4x^2 - 19x + 12$

$0 = (4x-3)(x-4)$

~~$x = \frac{3}{4}$~~   $x = 4$

9.  $(8x+3i)^2 = 0$

$\sqrt{\quad} \quad \sqrt{\quad}$

$8x+3i = 0$

$8x = -3i$

$x = \frac{-3i}{8}$

10.  $-2(x-1) - 10 < 2(x+2)$

$-2x + 2 - 10 < 2x + 4$

$-8 < 4x + 4$

$-12 < 4x$

$-3 < x$

$(-3, \infty) \leftarrow \text{number} \rightarrow$

11.  $-2 \leq \frac{1}{2}x + 3 \leq 4$

$-3 \quad \quad -3 \quad \quad -3$

$-5 \leq \frac{1}{2}x \leq 1$

$-10 \leq x \leq 2$

$[-10, 2] \leftarrow \text{number} \rightarrow$

12.  $\frac{x+1}{x-3} < 5$

$\frac{x+1}{x-3} - 5 < 0$

$x-3$

$\frac{x+1}{x-3} - \frac{5(x-3)}{x-3} < 0$

$\frac{-4x+16}{x-3} < 0$

$-4x+16=0 \quad x-3=0$

$x=4 \quad x=3$

$\leftarrow \text{number} \rightleftarrows$

$\frac{-4(0)+16}{0-3} < 0$

$(-\infty, 3) \cup (4, \infty)$

13.  $3x+4y=8$  same slope

$m = \frac{-3}{4}$

$y+4 = \frac{-3}{4}(x-3)$

$y = \frac{-3}{4}x + \frac{9}{4} - 4$

$y = \frac{-3}{4}x - \frac{7}{4}$

14.  $3x+4y=8$  opp, rec. slope

$m = \frac{-3}{4} \quad \perp m = \frac{4}{3}$

$y+4 = \frac{4}{3}(x-3)$

$y = \frac{4}{3}x - 4 - 4$

$y = \frac{4}{3}x - 8$

# SEMESTER REVIEW SOLUTIONS P.3

15.  $f(x) = \begin{cases} 5x-4 & \text{if } x \leq 1 \\ x & \text{if } x > 1 \end{cases}$  find  $f(4)$   
 Since  $4 > 1$   $f(4) = 4$

16.  $y = (x+1)^2 - 3$  parabola, opens up, vertex at  $-1, -3$   
 domain  $(-\infty, \infty)$  Range  $[-3, \infty)$

17.  $f(x) = 2x^2 - 3x + 2$   $g(x) = -2x + 1$   
 $(f \circ g)(x) = f(g(x)) = f(-2x + 1)$   
 $= 2(-2x + 1)^2 - 3(-2x + 1) + 2$   
 $= 8x^2 - 2x + 1$

18. a)  $(-4, -5)$  b)  $(-2, 11)$   
 $h = \frac{b}{-a} = -2$   
 $k = f(-2) = 11$

19.  $\frac{3x^5 - 1}{x - 1}$   $\begin{array}{r} 3 \ 0 \ 0 \ 0 \ 0 \ -1 \\ 3 \ 3 \ 3 \ 3 \ 3 \\ \hline 3 \ 3 \ 3 \ 3 \ 3 \ 2 \end{array}$   
 $3x^4 + 3x^3 + 3x^2 + 3x + \frac{2}{x-1}$

20.  $f(x) = 2x^3 - 3x^2 - 17x + 30$   $k = 2$

$\begin{array}{r} 2 \ 2 \ -3 \ -17 \ 30 \\ \underline{4 \ 2 \ -30} \\ 2 \ 1 \ -15 \ 0 \end{array}$   $(x-2)(2x-5)(x+3)$

$\cdot 2x^2 + x - 15$

$(2x-5)(x+3)$