

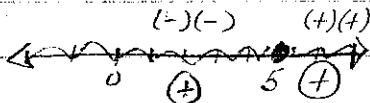
36 problems
Review #6 worth 2 points

Assignment 32 (Alg 2)

NEW Page 381

21. $b^2 \geq 10b - 25$
 $-10b + 25 \quad -10b + 25$

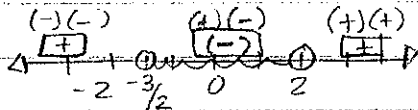
$b^2 - 10b + 25 \geq 0 \quad (b-5)(b-5) \geq 0 \quad (b-5)=0, b=5$



all reals (\mathbb{R})

23. $2b^2 - b < 6$
 $-6 \quad -6$

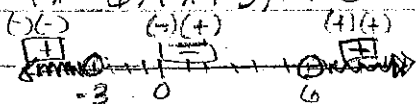
$2b^2 - b - 6 < 0 \rightarrow (2b+3)(b-2) < 0 \quad b = -\frac{3}{2}, 2$



$-\frac{3}{2} < b < 2$

39. $x^2 - 3x - 18 > 0$

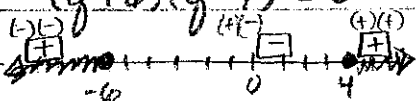
$(x-6)(x+3) > 0 \quad x = 6, -3$



$x < -3$ OR $x > 6$

41. $q^2 + 2q \geq 24$
 $24 \quad -24$

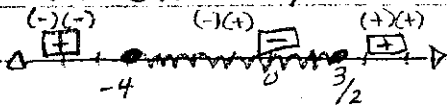
$q^2 + 2q - 24 \geq 0 \quad (q+6)(q-4) \geq 0 \quad q = -6, 4$



$q \leq -6$ OR $q \geq 4$

43. $2x^2 + 5x - 12 \leq 0$

$(2x-3)(x+4) \leq 0 \quad x = \frac{3}{2}, -4$



$-4 \leq x \leq \frac{3}{2}$

Assignment 32-continued

p381:

45. $w^2 \geq 2w$

$w^2 - 2w \geq 0$
 $w(w-2) \geq 0$
 Signs: $(-)(-)$, $(+)(-)$, $(+)(+)$
 Number line: 0 , 2
 $w = 0, 2$

$w \leq 0$ or $w \geq 2$

47. $2g^2 - 5g - 3 < 0$

$(2g+1)(g-3) < 0$
 Signs: $(-)(-)$, $(+)(-)$, $(+)(+)$
 Number line: $-\frac{1}{2}$, 3
 $g = -\frac{1}{2}, 3$

$-\frac{1}{2} < g < 3$

55. $(x-2)(x+2)(x-1)(x+3) \geq 0$

Number line: -4 , -3 , -2 , -1 , 0 , 1 , 2 , 3 , 4
 Signs: $(-)(-)$, $(-)(+)$, $(-)(+)$, $(+)(+)$, $(+)(+)$
 Signs: $(+)$, $(-)$, $(+)$, $(-)$, $(+)$

$x = 2, -2, 1, -3$

$x \leq -3$ or $-2 \leq x \leq 1$ or $x \geq 2$

Packet-New

Solve on calculator - round to 2 decimals.

1. $4x^2 - 9 \leq -4x$
 $+4x$ $+4x$

Number line: -2.08 , 0 , 1.08
 Signs: false, true, false

$-2.08 \leq x \leq 1.08$

$4x^2 + 4x - 9 \leq 0$

2. $-0.5x^2 + 12.5x + 1.6 > 0$
 (zoom out for complete graphs)

Number line: -13 , 25.13
 Signs: $(-)$, true, $(+)$

$-13 < x < 25.13$

3. $x^2 + 5 \leq 0$

Number line: 0
 No zeros - nothing true

No Solutions

4. $\frac{1}{2}a^2 - 2a + 1 \geq 7$
 -7 -7

Number line: -2 , 0 , 6
 Signs: true, false, true

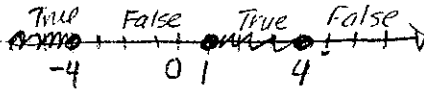
$a \leq -2$ or $a \geq 6$

$\frac{1}{2}a^2 - 2a - 6 \geq 0$

Assignment 32-Continued

(packet)

5. $x^3 - x^2 - 10x + 16 \leq 0$



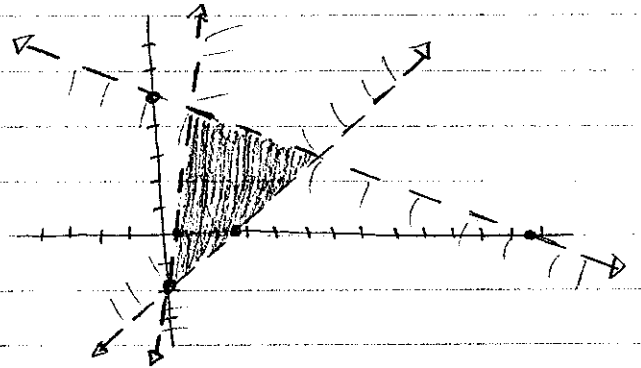
$x \leq -4$ or $1 \leq x \leq 4$

REVIEW

(2pts)

6. $5x - 7y < 14$
 $2x + 5y < 25$
 $y < 3x - 2$

$x_{int} (14/5, 0)$
 $y_{int} (0, -2)$
 $x_{int} (25/2, 0)$
 $y_{int} (0, 5)$
 $x_{int} (2/3, 0)$
 $y_{int} (0, -2)$



7. Factor: $162x^6 - 98$

$= 2(81x^6 - 49) = 2(9x^3 + 7)(9x^3 - 7)$

8. Express using rational exponents:

$y^{4/5} y^{5/2} = y^{8/10} y^{25/10} = y^{33/10}$

Given $g(x) = \frac{x^2 + 1}{4 + x}$;

9. $g(5) = \frac{5^2 + 1}{4 + 5} = \frac{26}{9}$

10. $g(-2) = \frac{(-2)^2 + 1}{4 + (-2)} = \frac{5}{2}$

11. $g(7c) = \frac{(7c)^2 + 1}{4 + 7c} = \frac{49c^2 + 1}{4 + 7c}$

12. $-2x^2 + x - 5$ $a = -2, b = 1, c = -5$

discriminant $= b^2 - 4ac = 1 - 40 = -39$, 2 imaginary roots

13. $2x^2 - 7 = -3x \rightarrow 2x^2 + 3x - 7 = 0$

disc $= (3)^2 - 4(2)(-7) = 9 + 56 = 65$, 2 irrational roots (real)

Assignment 32 - continued

Solve by quadratic formula:

14. $x^2 + 10x = -25 \rightarrow x^2 + 10x + 25 = 0$

$$x = \frac{-10 \pm \sqrt{10^2 - 4(1)(25)}}{2(1)} = \frac{-10 \pm \sqrt{100 - 100}}{2} = \frac{-10 \pm \sqrt{0}}{2} = \frac{-10}{2} = \boxed{-5}$$

15. $x^2 + x - 5 = 0$

$$x = \frac{-1 \pm \sqrt{1^2 - 4(1)(-5)}}{2(1)} = \frac{-1 \pm \sqrt{1 + 20}}{2} = \boxed{\frac{-1 \pm \sqrt{21}}{2}}$$

16. $x^2 + 12x + 32 = 0$

$$x = \frac{-12 \pm \sqrt{12^2 - 4(1)(32)}}{2(1)} = \frac{-12 \pm \sqrt{144 - 128}}{2} = \frac{-12 \pm \sqrt{16}}{2} = \frac{-12 \pm 4}{2}$$

$$\rightarrow \frac{-12 + 4}{2} = \frac{-8}{2} = -4 \text{ and } \frac{-12 - 4}{2} = \frac{-16}{2} = -8 \quad \boxed{x = -8, -4}$$

Use a calculator to find the roots:

17. $y = |2x + 3| - 7 \quad \boxed{x = -5, 2}$

18. $y = 6 + 2x\sqrt{3} \quad \boxed{x = -1.73}$

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70. $\sqrt[4]{2x-1} = 2$

$$\begin{array}{r} 2x-1 = 16 \\ +1 \quad +1 \end{array}$$

$$\frac{2x-1}{2} = \frac{17}{2} \rightarrow \boxed{x = \frac{17}{2}}$$

71. $\sqrt{y+5} = \sqrt{2y-3}$

$$\begin{array}{r} y+5 = 2y-3 \\ -y \quad -y \end{array}$$

$$\begin{array}{r} 5 = y-3 \\ +3 \quad +3 \end{array}$$

$$\boxed{8 = y}$$

Assignment 32 - Continued

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14. $(3y-5)(2y+7) = 0$

$3y-5=0$ or $2y+7=0$

$\frac{3y-5}{+5 \quad +5} = 0$
 $\frac{3y}{3} = \frac{5}{3}$

$\frac{2y+7}{-7 \quad -7} = 0$
 $\frac{2y}{2} = \frac{-7}{2}$

$\rightarrow y = \frac{-7}{2}, \frac{5}{3}$

28. $6r^2+7r=3 \rightarrow 6r^2+7r-3=0$

$(2r+3)(3r-1)=0$

$2r+3=0$

$3r-1=0$

$2r=-3$

$3r=1$

$r = -\frac{3}{2}$

$r = \frac{1}{3}$

$r = -\frac{3}{2}, \frac{1}{3}$

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20. Write the equation with the given roots: 6, 6

$x=6$ $x=6$

$(x-6)=0$ $(x-6)=0 \rightarrow (x-6)(x-6)=0$

$x^2-6x-6x+36=0 \rightarrow x^2-12x+36=0$

24. $\frac{4}{3}, -\frac{1}{6}$

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

$x = -\frac{1}{6}$

$(3x-4)(6x+1)=0$

$18x^2+3x-24x-4=0$

$18x^2-21x-4=0$

$3x=4$

$6x=-1$

$(3x-4)=0$

$(6x+1)=0$

47. $f(x) = x^2+8x-5$

vertex: $(-4, -21)$

(calculator)

axis of symmetry: $x = -4$

Assignment 32 - continued

Page 350:

20. $x^2 + 15x + c$ $c = \left(\frac{15}{2}\right)^2 = \frac{225}{4}$

22. $x^2 + 2x - 120 = 0$
 $\quad \quad \quad +120 \quad +120$

$\left(\frac{2}{2}\right)^2 = 1^2 = 1$

$x^2 + 2x + 1 = 120 + 1$

$(x+1)^2 = 121$

$\sqrt{(x+1)^2} = \pm\sqrt{121}$

$x+1 = \pm 11$

$x = -1 \pm 11$ $\begin{cases} -1+11 = 10 \\ -1-11 = -12 \end{cases}$

$x = 10, -12$

24. $x^2 + 7x - 17 = 0$
 $\quad \quad \quad +17 \quad +17$

$\left(\frac{7}{2}\right)^2 = \frac{49}{4}$

$x^2 + 7x + \frac{49}{4} = 17 + \frac{49}{4}$

$(x + \frac{7}{2})^2 = \frac{68}{4} + \frac{49}{4}$

$(x + \frac{7}{2})^2 = \frac{117}{4}$

$\sqrt{(x + \frac{7}{2})^2} = \pm\sqrt{\frac{117}{4}}$

$x + \frac{7}{2} = \pm\frac{\sqrt{117}}{2}$

$\quad \quad \quad -\frac{7}{2} \quad \quad \quad -\frac{7}{2}$

$x = \frac{-7 \pm \sqrt{117}}{2} \rightarrow$

$x = \frac{-7 \pm 3\sqrt{13}}{2}$

$\sqrt{117}$
 $\quad \quad \quad \wedge$
 $\quad \quad \quad 3 \quad 39$
 $\quad \quad \quad \quad \quad \wedge$
 $\quad \quad \quad \quad \quad 3 \quad 13$