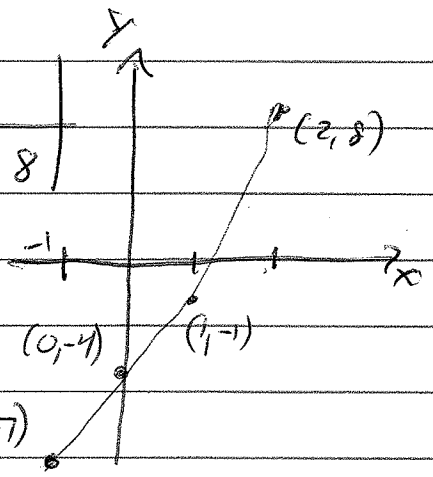


Corresponding HW problem ↓

Math 115 Exam 1a Solutions

1.1 #5,7

①	$x -1$	0	1	2
	$y -4 - 2 - 1 = -7$	-4	$-4 + 2 + 1 = -1$	$-4 + 4 + 8 = 8$



1.2 #5c

② No, we cannot plug $x=2$ into $\frac{1}{x-2}$ because the denominator would be zero; so this is not a solution.

1.3 #23

③ $4 + (0, 2) L$

1.7 #5

④ $x \geq 2$

1.7 #1-11 odd

⑤ $[-8, -1)$

2.1 #21, 23

⑥ $(-2 - 4) / (4 - (-1)) = -6/5$

1.4 #13

⑦ $(11x + 32x - 1) = 0 \Rightarrow x = -3/11, 1$

1.7 #33

⑧ $6x - 4 \leq 16x - 12 \Rightarrow -10x - 4 \leq -12 \Rightarrow -10x \leq -8 \Rightarrow x \geq 4/5$

1.6 #1

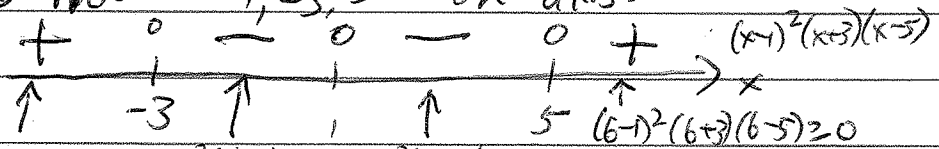
⑨ $x^2(x^2 + 11) = 0 \Rightarrow x^2 = 0, -11 \Rightarrow x = 0$ ($\pm\sqrt{-11}$ is not a real solution)

1.6 #31

⑩ $\sqrt{5-3x} = 3 \Rightarrow 5-3x = 9 \Rightarrow -3x = 4 \Rightarrow x = -4/3$, (check works)

1.8 #27-31

⑪ Plot $x = 1, -3, 5$ on axis:



$(-4-1)^2(-4+3)(-4-5) > 0$ $(-1)^2(3)(-5) < 0$ $(3-1)^2(3+3)(3-5) < 0$

Solution = $x \leq -3$ or $x \geq 5$ or $x = 0$

OR: $(-\infty, -3] \cup [5, \infty) \cup \{0\}$

1.6 #13, 23

⑫ $(x^3 - 1)(x^3 - 6) = 0 \Rightarrow x^3 = 1, 6 \Rightarrow x = 1, \sqrt[3]{6}$

1.6 #41

⑬ Square: $x = (\sqrt{x-5} + 1)^2 = x - 5 + 2\sqrt{x-5} + 1$
 $\Rightarrow 4 = 2\sqrt{x-5} \Rightarrow 2 = \sqrt{x-5} \Rightarrow 4 = x - 5 \Rightarrow x = 9$ (check works)

1.3 #73

⑭ Let $x = \#$ lbs of peanuts. Then $100 - x = \#$ lbs almonds.
 So $3(x) + 4(100 - x) = 100(3.20) \Rightarrow 3x + 400 - 4x = 320 \Rightarrow x = 80$
 $\Rightarrow x = 80$ [80 lbs of peanuts]

1.6 #103

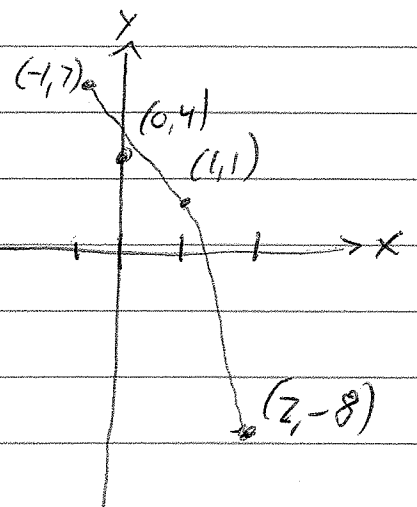
⑮ One does the job in x hours, the other $x+2$ hours.
 Then $\frac{1}{x} + \frac{1}{x+2} = \frac{1}{3} \Rightarrow 3(x+2) + 3x = x^2 + 2x \Rightarrow 6x + 6 = x^2 + 2x$
 $\Rightarrow x^2 - 4x - 6 = 0 \Rightarrow x = \frac{4 \pm \sqrt{16 - 4(-6)}}{2} = 2 \pm \sqrt{10}$ Fast worker = $2 + \sqrt{10}$ hr, Slow = $4 + \sqrt{10}$ hrs

Corresponding HW
Problem ↓

Math 115 Exam 1b solutions

1.1 #5,7

①	x	-1	0	1	2
	y	$4+2+1=7$	4	$4-2-1=1$	$4-4-8=-8$



1.2 #5c

② No, we cannot plug $x=3$ into $\frac{1}{x-3}$ because the denominator would be zero; so this is not a solution.

1.3 #23

③ $(0,4) L-8$

1.7 #5

④ $x \leq 4$

1.7 #11 odd

⑤ $(-10, -5]$

2.1 #21,23

⑥ $(-7-3)/(4-1) = -10/3$

1.4 #13

⑦ $(7x+3)(x-1) = 0 \Rightarrow x = 1, -3/7$

1.7 #33

⑧ $5x-4 \leq |4x-2| \Rightarrow 17 \leq 9x \Rightarrow 17/9 \leq x \Rightarrow x \geq 17/9$

1.6 #1

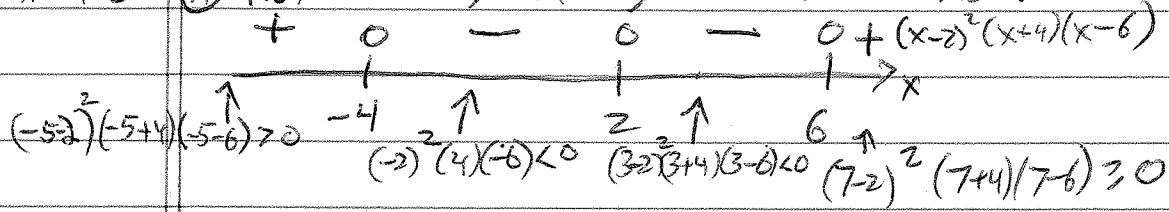
⑨ $x^3(x^2+13) = 0 \Rightarrow x^3 = 0$ or $x^2 = -13 \Rightarrow x = 0$ ($x = \pm\sqrt{13}$ is not real.)

1.6 #31

⑩ $\sqrt{6-3x} = 4 \Rightarrow 6-3x = 16 \Rightarrow -3x = 10 \Rightarrow x = -10/3$

1.8 #27-31

⑪ Plot $x-2=0, x+4=0, x-6=0$ on x -axis:



Solution: $x \geq 6, x \leq -4$ or $x = 2$. Or: $[6, \infty) \cup (-\infty, -4] \cup \{2\}$

1.6 #13,23

⑫ $(x^3-7)(x^3-1) = 0 \Rightarrow x^3 = 7$ or $1 \Rightarrow x = 1$ or $\sqrt[3]{7}$

1.6 #41

⑬ Square: $x = (\sqrt{x-5} + 1)^2 = x-5 + 2\sqrt{x-5} + 1$
 $\Rightarrow 4 = 2\sqrt{x-5} \Rightarrow 2 = \sqrt{x-5} \Rightarrow 4 = x-5 \Rightarrow x = 9$ check works.

1.3 #73

⑭ Let $x = \#$ lbs of peanuts. Then $100-x = \#$ lbs almonds.
 $\therefore 2(x) + 4(100-x) = (3.30)(100) \Rightarrow 2x + 400 - 4x = 330$
 $\Rightarrow -2x = -70 \Rightarrow x = 35$ [35 lbs of peanuts]

1.6 #103

⑮ One does the job in x hours, the other in $x+3$ hours.
 Then $\frac{1}{x} + \frac{1}{x+3} = \frac{1}{4} \Rightarrow (x+x+3)4 = x(x+3) \Rightarrow 8x+12 = x^2+3x$
 $\Rightarrow x^2-5x-12 \Rightarrow x = \frac{5 \pm \sqrt{25-4(-12)}}{2} = \frac{5 \pm \sqrt{73}}{2}$. Since $x > 0, x = \frac{5+\sqrt{73}}{2}$.
 Fast worker: $\frac{5+\sqrt{73}}{2}$ hours. Slow worker: $3 + \frac{5+\sqrt{73}}{2} = \frac{11+\sqrt{73}}{2}$ hrs.