

Math 105 Exam 1 Review Solutions

1-3 Factor

① $4x^2 - 49$
 $= (2x+7)(2x-7)$

② $x^2 - 5x - 24$ $\begin{matrix} -8 & -24 \\ +3 & -5 \end{matrix}$
 $= x^2 - 8x + 3x - 24$
 $= x(x-8) + 3(x-8)$
 $= (x+3)(x-8)$

③ $2x^2 - x - 21$ $\begin{matrix} -7 & -42 \\ +6 & -1 \end{matrix}$
 $= 2x^2 - 7x + 6x - 21$
 $= x(2x-7) + 3(2x-7)$
 $= (2x-7)(x+3)$

4-6 Solve

④ $x^2 = 9$
 $\begin{matrix} -9 & -9 \end{matrix}$
 $x^2 - 9 = 0$
 $(x-3)(x+3) = 0$
 $x-3 = 0$ or $x+3 = 0$
 $\begin{matrix} +3 & +3 & -3 & -3 \end{matrix}$
 $x = 3$ or $x = -3$

⑤ $x^2 - 2x = 8$ $\begin{matrix} -8 & -8 \\ -4 & +2 \end{matrix}$
 $x^2 - 2x - 8 = 0$
 $x^2 - 4x + 2x - 8 = 0$
 $x(x-4) + 2(x-4) = 0$
 $(x-4)(x+2) = 0$
 $x-4 = 0$ or $x+2 = 0$
 $\begin{matrix} +4 & +4 & -2 & -2 \end{matrix}$
 $x = 4$ or $x = -2$

⑥ $3x^2 = 7x - 2$ $\begin{matrix} -7 & -7x \\ +2 & +2 \end{matrix}$
 $3x^2 - 7x = -2$
 $3x^2 - 7x + 2 = 0$ $\begin{matrix} -6 & -6 \\ -1 & -1 \end{matrix}$
 $3x^2 - 6x - x + 2 = 0$
 $3x(x-2) - 1(x-2) = 0$
 $(x-2)(3x-1) = 0$
 $x-2 = 0$ or $3x-1 = 0$
 $\begin{matrix} +2 & +2 & +1 & +1 \end{matrix}$
 $\frac{3x}{3} = \frac{1}{3}$
 $x = 2$ or $x = \frac{1}{3}$

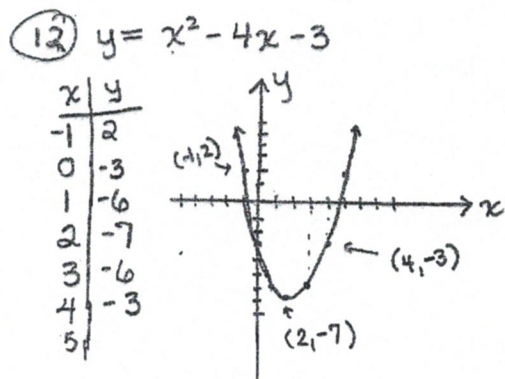
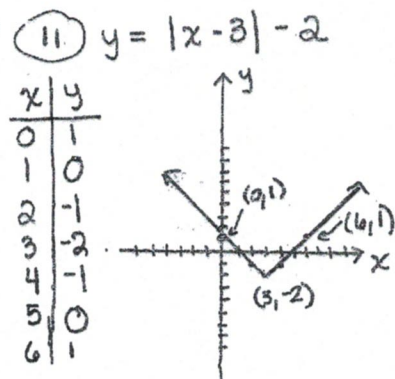
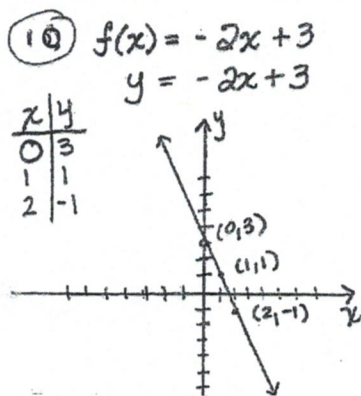
7-9 If $f(x) = 7 - x - x^2$, evaluate:

⑦ $f(5) = 7 - 5 - 5^2$
 $= 7 - 5 - 25$
 $= 2 - 25$
 $= -23$

⑧ $f(-3) = 7 - (-3) - (-3)^2$
 $= 7 - (-3) - 9$
 $= 7 + 3 - 9$
 $= 10 - 9$
 $= 1$

⑨ $f(\frac{2}{3}) = 7 - \frac{2}{3} - \frac{2^2}{9}$

10-12 Graph



13-15 Solve

⑬ $|2x+5| = 13$
 the two numbers that have an absolute value of 13 are 13 or -13 so the expression in the absolute value = 13 or -13
 $2x+5 = 13$ or $2x+5 = -13$
 $\begin{matrix} -5 & -5 & -5 & -5 \end{matrix}$
 $\frac{2x}{2} = \frac{8}{2}$ $\frac{2x}{2} = \frac{-18}{2}$
 $x = 4$ $x = -9$

⑭ $2|x-5| - 3 = -3$ $\begin{matrix} +3 & +3 \end{matrix}$
 $\frac{2|x-5|}{2} = \frac{0}{2}$
 $|x-5| = 0$
 the only number with absolute value zero is zero.
 $x-5 = 0$
 $\begin{matrix} +5 & +5 \end{matrix}$
 $x = 5$

⑮ $|2x-3| + 5 = 4$ $\begin{matrix} -5 & -5 \end{matrix}$
 $|2x-3| = -1$
 There are no numbers that have an absolute value equal to -1. So this equation has no solutions.
NO Solution