Name: ______________________________ Math 211 Quiz 2

Section: 302 ☐ 303 ☐ Feb 1, 2012

1. Find the points of intersection (if any) of the given pair of curves and draw the graphs.

a. $y = 3x + 5$ and $y = -x + 3$; **b.** $y = x^2$ and $y = 3x - 2$.

$3x+5 = -x+3$

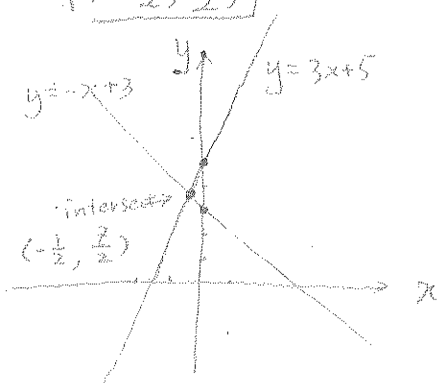
$4x = -2$

$x = -\frac{1}{2}$

$y = -(-\frac{1}{2})+3$

$= \frac{7}{2}$

$\boxed{(-\frac{1}{2}, \frac{7}{2})}$



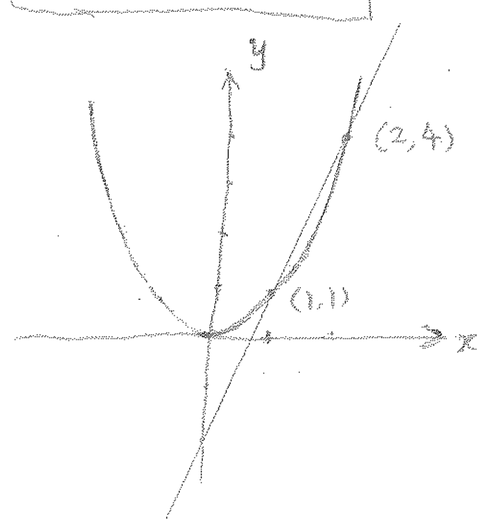
$x^2 = 3x - 2$

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

$(x-1)(x-2) = 0$

$x = 1$ or 2

$\boxed{(1,1) \text{ or } (2,4)}$



2. Write an equation for the line with the given properties.

a. Through $(5, -2)$ with slope $-\frac{1}{2}$; **b.** Through $(2, 5)$ and $(1, -2)$.

$y-(-2) = -\frac{1}{2}(x-5)$

$= -\frac{1}{2}x + \frac{5}{2}$

$y + 2 = -\frac{1}{2}x + \frac{5}{2}$

$\boxed{y = -\frac{1}{2}x + \frac{1}{2}}$

$y - 5 = \frac{-2-5}{1-2}(x-2)$

$= 7(x-2)$

$= 7x - 14$

$\boxed{y = 7x - 9}$

3. Find the indicated limit if it exists.

a. $\lim_{x\to -1}(x^2+1)(1-2x)^2$; **b.** $\lim_{x\to 1}\frac{x^2-1}{x-1}$

$= \left((-1)^2+1\right)\left(1-2(-1)\right)^2$

$= 2\cdot(3)^2$

$= 2\cdot 9$

$= \boxed{18}$

$= \lim_{x\to 1}\frac{\cancel{(x-1)}(x+1)}{\cancel{x-1}}$

$= \lim_{x\to 1}(x+1)$

$= \boxed{2}$

Bonus. The average scores of incoming students at an eastern liberal arts college in the SAT mathematics examination have been declining at a constant rate in recent years. In 1995, the average SAT score was 575, while in 2000 it was 545.
a. Express the average SAT score as a function of time.
b. If the trend continues, what will the average SAT score of incoming students be in 2005?
c. If the trend continues, when will the average SAT score be 527?

a) the graph of the score function goes through $(1995, 575)$ and $(2000, 545)$

by point-point formula the equation is

$y - 545 = \frac{545-575}{2000-1995}(x-2000)$

$= \frac{-30}{5}(x-2000)$

$= -6x + 12000$

$\boxed{y = -6x + 12545}$ or $\boxed{y = 545 - 6(t-2000)}$

b) $y(2005) = -6\cdot 2005 + 12545 = \boxed{515}$

c) $527 = -6x + 12545 \Rightarrow x = \boxed{2003}$