Homework 3 (Lines and Graphs) SOLUTION (Total 100 pts)

MA 103, Instructor: Jeffrey Horn, Winter 2017

Assignment:

1. This one is out of the book! (which means that the answers to adjacent (odd-numbered) problems, which are available, should be helpful!).

2. Section 1.1, p. 6: (#12, 14); p. 7: (#16, 18, 20, 22, 36, 38, 42, 46, 50, 60, 62, 70, 72).

3. Show work for partial credit but clearly indicate a unique final answer! (e.g., circle it, put a box around it, etc.)

Question 12. (5 pts) $\boxed{\text{No.}}$

(If you plug the given coordinate, $(2, 6)$, into the equation, the left hand side will NOT equal the right hand side!)

Question 14. (5 pts) $\boxed{\text{Yes.}}$

Question 16. (5 pts) $\boxed{y = -2x - 6 \qquad m = -2 \qquad b = -6}$

Question 18. (5 pts) $\boxed{y = \frac{2}{3}x \qquad m = \frac{2}{3} \qquad b = 0}$

Question 20. (5 pts) $x - y = 3 \;\Rightarrow\; \boxed{y = x - 3}$

Question 22. (5 pts) $\frac{1}{2}x + \frac{2}{3}y = 10 \;\Rightarrow\; \boxed{y = \frac{3}{4} + 15}$

Question 36. (5 pts) $\frac{1}{2}x - 5y = 1 \qquad \boxed{d, e, f}$

Question 38. (5 pts) $\boxed{\text{(c) } 2y = x + 3}$

Question 42. (20 pts total)

- (a) (5 pts)
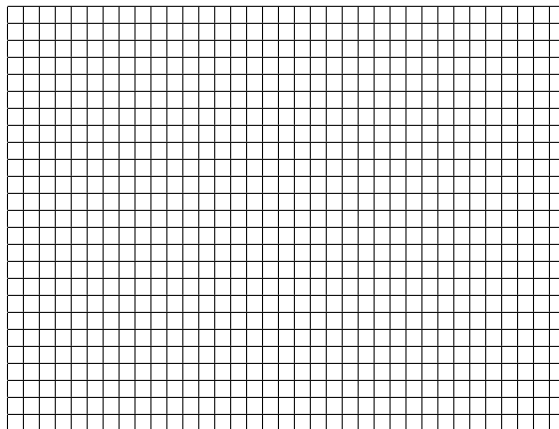
- (b) (5 pts) | The y-intercept is the ecotourism income in the year 2000.

- (c) (5 pts) | 2005 or 2006 | The ambiquity arises because the question does not specify whether the x-axis marks the number of years since the beginning of 2000 or since the end of 2000. Solving for the number of years (x-value) until ecotourism income (the y-value) is $20000 yields approximately 5.22 (years). If $x = 0$ marks the beginning of the year 2000, then 5.22 years later is 2005. If $x = 0$ marks the end of 2000, then 5.2 years later is 2006!

- (d) (5 pts) | $32,400 in 2014

Question 46. (15 pts total)

- (a) (5 pts) | In the year 2000 9.7% of college freshman smoked.

- (b) (5 pts) | 7.1%

- (c) (5 pts) | 2008

Question 50. (5 pts) | $y = -1.5x + 0.9$

Question 60. (5 pts) | $3x - y = 4$ **or** $y - 3x = -4$

Question 62. (5 pts) | $4x - y = \frac{5}{6}$ **or** $y - 4x = -\frac{5}{6}$

Question 70. (5 pts)

All equations of the form $ax + by = 0$ (or $y = \frac{a}{b}x$) pass through the origin. The key characteristic of lines passing through $(0,0)$ is having zero for their y-intercept. E.g., | $y = x.$

Question 72. (5 pts)

Here again there are many possible equations for lines passing through the positive side of the x-axis. This requirement means that such a line must have a zero x-intercept, thus when pluggin in zero for y in the equation, solving for x must yield a positive number for x. E.g., | $y = x - 3$