

NAME _____

4 March 2009

MATH 121-003 — TEST II

PLEASE READ THESE INSTRUCTIONS:

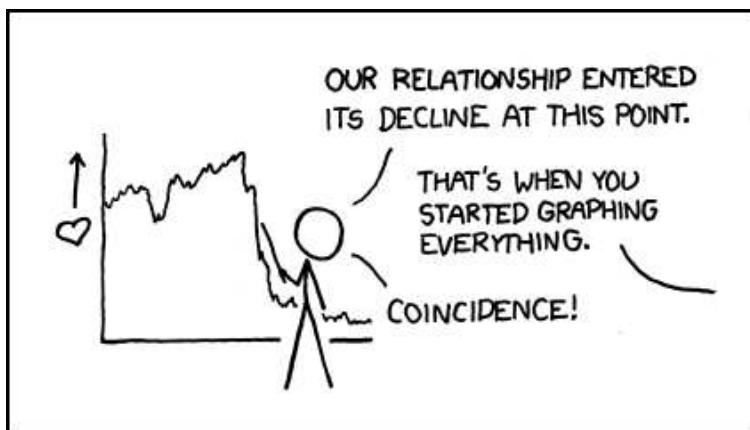
Problems have varying point values, indicated next to each problem and problem part. Do as many problems as you like – any points over 100 you earn will count as extra credit.

If you want credit for an answer, you **must** show your work – a correct answer without accompanying (and correct and readable) explanation will likely receive **zero credit**.

You may use a graphing calculator, but **not** a calculator (such as the TI-89) capable of symbolic manipulation. You may not use your book or notes.

[Please do not write in the boxes below:]

PLEASE TURN OFF YOUR CELL PHONE.



(from <http://www.xkcd.com>)

1 :	/5	
2 :	/5	
3 :	/10	
4 :	/10	
5 :	/10	
6 :	/10	
7 :	/10	
8 :	/10	
9 :	/10	
10 :	/10	
11 :	/16	
12 :	/14	
13 :	/12	
Σ :	/132	

- (5) **1** What is the distance between the points $P_1 = (1, 1)$ and $P_2 = (7, 9)$?
- (5) **2** What is the midpoint of the line segment between the points $P_1 = (1, 1)$ and $P_2 = (7, 9)$?
- (10) **3** Write down an equation for a circle one of whose diameters is the the line segment between the points $P_1 = (1, 1)$ and $P_2 = (7, 9)$. [*Hint: where is the center? What is the radius?*]
- (5+5) **4** What is/are the x -intercept/intercepts of the curve given by $(x - 4)^2 + (y - 5)^2 = 25$?
What is/are the y -intercept/intercepts of the same curve?
- (10) **5** What is an equation of the line passing through the point $(4, 5)$ and perpendicular to the line segment between the points $P_1 = (1, 1)$ and $P_2 = (7, 9)$?

- (10) **6** What is an equation of the line passing through the origin and parallel to the line segment between the points $P_1 = (1, 1)$ and $P_2 = (7, 9)$?
- (10) **7** Write an equation which describes a situation when a variable y varies inversely with $\sqrt{x}$, if we know that $y = 4$ when $x = 9$.
- (10) **8** What is the domain of the function $f(x) = \frac{x}{\sqrt{x-2}}$? Give your answer in interval notation.
- (10) **9** Is the function $f(x) = \frac{x}{x^2+3}$ *even*, *odd*, or *neither*?

- (10) **10** Write the equation for a function which results when we take the function $y = \sqrt{x}$ and shift it left 2 units and up 3; graph it as well.

- (4×4) **11** For the function $f(x)$ with graph

(a) list the intervals on which $f(x)$ is increasing,

(b) the intervals on which $f(x)$ is decreasing,

(c) the locations and values of the local maxima of $f(x)$, and

(d) the locations and values of the local minima of $f(x)$.

(3+5+6) **12**

For the functions $f(x) = x + 1$ and $g(x) = x - 1$, determine

(a) $(f + g)(2)$;

(b) the general formula for the function $(f \cdot g)(x)$ and its domain; and

(c) the general formula for the function $(f/g)(x)$ and its domain.

(4×3) **13**

For the graphs

(a) which could be graphs of functions, which could not, and why?

(b) for those which are functions, determine (by eye) their domains and ranges;

(c) just by eye, which of those you said are functions are *even* and which are *odd*

(d) for those which are not functions, determine if they are symmetric with respect to the x -axis, the y -axis, and/or the origin.