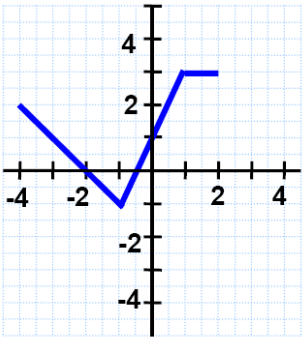
Follow these directions carefully.

- **<u>This quiz is due by 11:59 Eastern time on September 18, 2016.</u>**
  - This is an important assignment, counting 8% of your grade.
  - Submit this assignment in your assignments folder by the due date.
- **Answer all the questions.** There are 24 problems on 5 pages.
  - There are 100 points possible.
  - **No work is required** for the **MULTIPLE CHOICE SECTION** or for the **SHORT ANSWER SECTION**. There is **<u>no partial credit</u>** for these problems, so please **<u>consider your answers carefully</u>**.
  - **Show all work** for the **LONG ANSWER SECTION**. There is partial credit for these problems
- **<u>Use the template</u>** provided to answer the MULTIPLE CHOICE and SHORT ANSWER questions. Please use a separate document to answer the long answer section. You may type up your answers in a document (like Word or Excel) or handwrite your answers and scan them in – up to you.
- **Submit your assignment as an attachment**. Under no circumstances should you type your answers into a text box.

MULTIPLE CHOICE QUESTIONS. (30 pts total, 3 pts each)

1. On what interval is the function below decreasing?



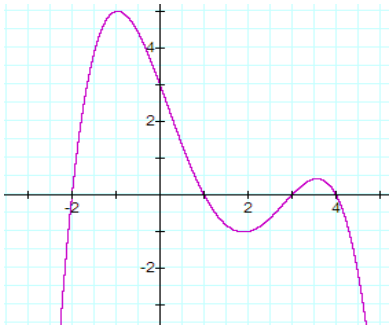
A. $(-4,-1)$ C. $(2,-1)$
B. $(-1,2)$ D. Not decreasing on any interval.

2. What is the slope of any line parallel to $2x-3y=8$?
A. $3/2$ C. $-3/2$
B. $2/3$ D. $-2/3$

3. What is the slope of any line perpendicular to $2x-3y=8$?
A. $3/2$ C. $-3/2$
B. $2/3$ D. $-2/3$

4. What is an equation of the line with slope 2 and containing the point $(-3,3)$?
A. $y=2x+3$ C. $y=2x+6$
B. $y=2x+9$ D. $y=2x-3$

5. On what interval(s) is the function graphed below increasing?



A. $(-1,2) \cup (3/2, \infty)$ C. $(-\infty, -1) \cup (2,7/2)$
B. $(-5,5) \cup (-1,1)$ D. None of these

6. The line joining $(-5,5)$ and $(5,5)$ is horizontal.
T. True
F. False

7. If $f(x) = x^2$, then $f(-1)$ is equal to -1.
T. True
F. False

8. If a function is even, then its graph is symmetric about the y-axis.
T. True
F. False

9. If a function is odd, then its graph is symmetric about the origin.
T. True
F. False

10. The function $f(x) = x^4 - 3x^2$ is even.
T. True
F. False

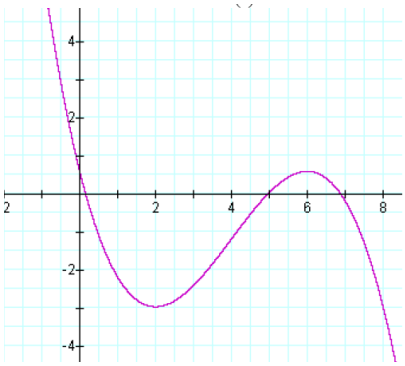
SHORT ANSWER QUESTIONS. (42 pts total, 3 pts each)

11. Write an equation for a function that has the shape of $y = |x|$, but is shifted left two units and up 3 units.

12. Write an equation for a function that has the shape of $y = x^2$, but is shifted right two units and down 3 units.

13. Find the slope of the line containing the points $(-8, -5)$ and $(8,11)$.

Questions 14 and 15 involve the function graphed below.



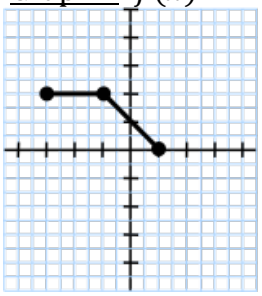
14. On what interval(s) is the function increasing? Express your answer in interval notation.

15. On what interval(s) is the function decreasing? Express your answer in interval notation.

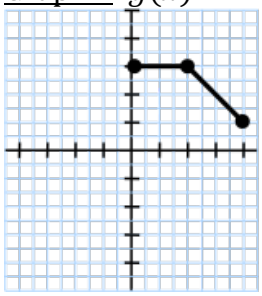
16. Suppose $f(x) = -x^2 + 2x - 3$. Determine $f(-1)$. Be careful.

Questions 17, 18, 19, 20 and 21 involve Graphs 1 and 2 appearing directly below.

Graph 1: $f(x)$



Graph 2: $g(x)$



You're given the information that Graphs 1 and 2 are piecewise linear, and that Graph 2 is a transformation of Graph 1 using horizontal and vertical translations.

Each numbered or lettered part is worth 3 points. So Question 20 is worth 12 points, 3 points for each lettered part.

In Questions 17 and 18, fill in the blanks.
HINT: Each long tick mark represents one unit. Therefore, the first piece of the graph of *f* is a *line* containing the points (-3,2) and (-1,2), while the second piece is a *line* containing the points (-1,2) and (1,0). How do you find an equation of a line?

$$f(x) = \begin{cases} \textbf{17.}\ \_\_\_\_\_, & -3 \le x < -1 \\ \textbf{18.}\ \_\_\_\_\_, & -1 \le x \le 1 \end{cases}$$

19. Determine the range of *f* in interval notation.

20. Which of the following is correct? (Note that the graph of *g(x)* is gotten by shifting the graph of *f(x)* right 3, and then up 1.)

A. $g(x) = f(x-3)+1$
B. $g(x) = f(x+3)-1$
C. $g(x) = f(x+3)+1$
D. $g(x) = f(x-3)-1$

LONG ANSWER PROBLEMS. (40 pts total, 10 pts each)

21. Write the absolute value function $f(x) = 5 - 3|x - 2|$ as a piecewise defined function without absolute values.

22. Find an equation of the line, in slope-intercept form, containing the points $(-3,6)$ and $(5,-14)$.

23. Find an equation of the line perpendicular to the line $y = 3x - 2$ and which passes through the point $(-1,2)$. Express your answer in slope-intercept form.

24. A salesperson earns a base salary of \$3,200 per month and a commission of 5% on the amount of sales made.

A. Write down the linear function which expresses the paycheck as a function of the amount of sales made. (6 pts)

B. If the person has a paycheck of \$5,700.00 for one month, what was the amount of sales for the month? (4 pts)