

MTH:160C

Name:

TEST 1

Please, read each question *carefully*, be neat and **show all work**.

Write all answers in simplest form. **Not enough work shown = no credit given.**

Every answer you write down is worth 4 points. (There are 25 answers to write.)

1. Multiply and simplify your answer:

$$(3 + 4i)(5 - i)$$

2. Simplify:

$$i^{21}$$

3. Solve the inequality and write your answer using interval notation:

$$|3x - 1| \leq 4$$

4. Solve by using the **Square Root Property**: (*simplify answers*)

a) $x^2 = -12$

b) $(2x + 5)^2 = 49$

5. Solve by **Completing The Square**:

a) $t^2 - 10t + 1 = 0$

b) $2x^2 + 8x + 7 = 0$

6. Solve by using the **Quadratic Formula**:

$$3x^2 + 2x = -5$$

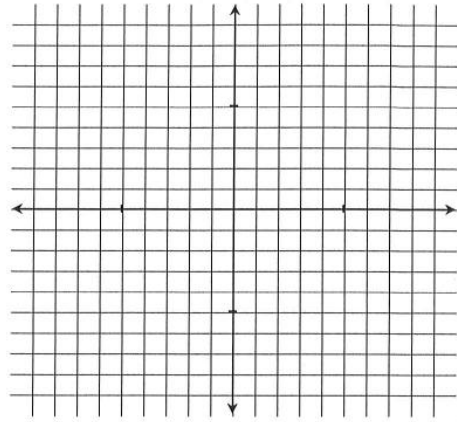
7. Solve by using any method:

a) $\frac{8}{x^2} + \frac{7}{x} = 1$

b) $2x - \sqrt{x} = 3$

8. Graph the given function:

$$f(x) = \begin{cases} 2x + 1, & x < 1 \\ 5, & x \geq 1 \end{cases}$$



9. Given $f(x) = x^2 + 2x - 4$ and $g(x) = -2x + 1$, find all of the following:

a) $(f - g)(x)$

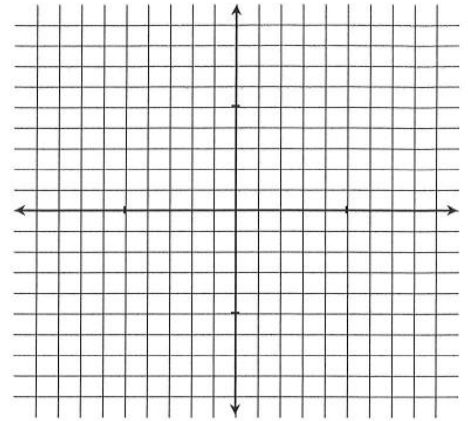
b) $(f + g)(-4)$

c) $(f \circ g)(3)$

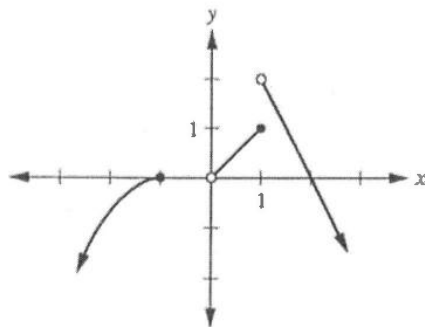
d) What is domain of $\left(\frac{f}{g}\right)(x)$?

10. Graph the equation:

$$f(x) = -(x - 5)^2 + 1$$



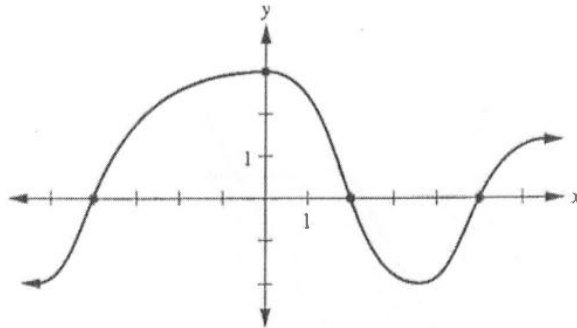
11. Find the domain and range for the function given by the graph below. Write your answers using interval notation.



a) Domain:

b) Range:

13. Let $f(x)$ be the function with the following graph. Use this graph to answer questions below:

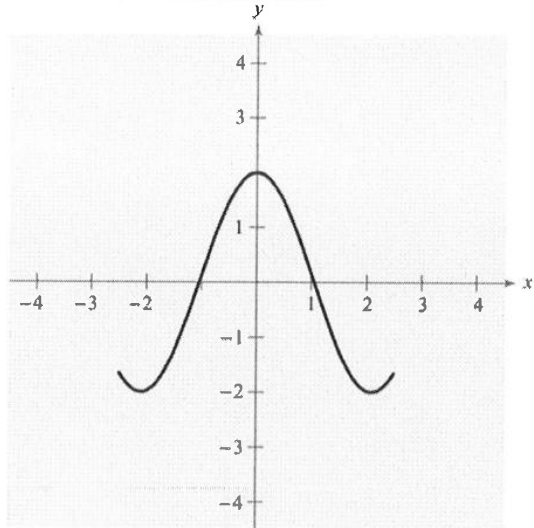


- a) Find the rate of change of function f on interval $[0, 2]$.

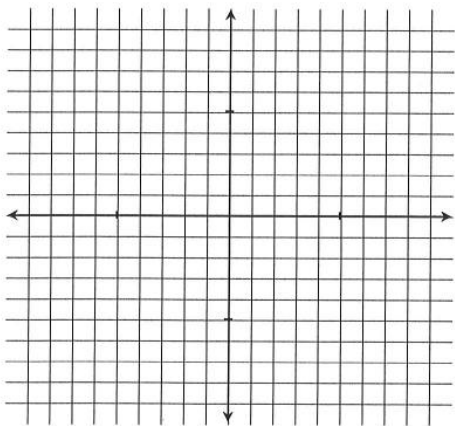
- b) List interval(s) of decrease of f .

Bonus problem: (3 pts each) – no partial credit given

1. Consider the graph of function f shown in the figure below. Use this graph to sketch each function:



a) $f(x + 1)$



b) $-f(x)$

