

Simon Fraser University  
Math 100

Midterm 1- Exam 1

**Date:** October 3, 2007

**Time:** 11:30 - 12:20am

**Last Name (print):** \_\_\_\_\_ **First Name** \_\_\_\_\_

**Signature:** \_\_\_\_\_ **SFU Email ID:** \_\_\_\_\_

**Instructor:** Laura Chávez Lomelí.

**Instructions:**

1. Do not open this exam until instructed to do so.
2. **No calculators, notes or books are allowed.**
3. When presenting a final answer for your solution, calculator-ready expressions will be given full credit.
4. Show all your work. **No credit** will be given for an answer without the correct accompanying work.
5. Answer the questions in the space provided. Continue on the back of the previous page if necessary.

Question	Mark	Maximum
1		10
2		10
3		12
4		8
5		5
Total		45

1. This question refers to the points  $A(-1, 6)$ ,  $B(-3, -5)$  and  $C(3, 3)$

[2 pts] (a) Find the midpoint  $P$  of the segment with endpoints  $A$  and  $B$

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[2 pts] (b) Determine the distance between  $A$  and  $B$

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[4 pts] (c) Give the equation of the circle with center at  $C$  and passing through the origin  $(0, 0)$ .

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[2 pts] (d) The distance from  $A$  to  $C$  is 5 and the distance from  $B$  to  $C$  is 10. Are the points  $A$ ,  $B$  and  $C$  the vertices of a right triangle? Answer Yes, No. Explain.

2. This question deals with lines and their equations.

[2 pts]      (a) Find the equation of the line  $L$  with slope  $m = 3$  and  $y$ -intercept  $(0, 6)$ .

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[2 pts]      (b) Determine the  $x$ -intercept of  $L$ .

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[3 pts]      (c) Find the equation of the line  $L_2$  perpendicular to  $L$  passing through the point  $(-9, 6)$ .

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[3 pts]      (d) Find the intersection of the lines  $L$  and  $L_2$ .

3. Consider the functions  $f(x) = \sqrt{x-2}$  and  $g(x) = 2x^2 - 30$ .

[4 pts]      (a) Find the equation of  $f^{-1}(x)$ .

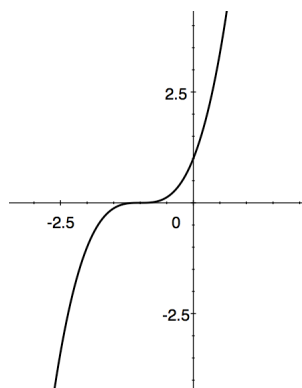
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[4 pts]      (b) Find an expression for  $(f \circ g)(x)$ . Simplify.

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[4 pts]      (c) Determine the domain of  $(f \circ g)(x)$

[8 pts]

4. The following graph is the graph of the function  $f(x)$ .

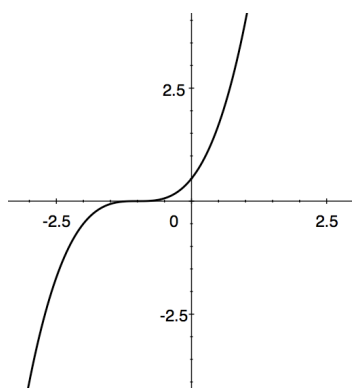
Identify the following graphs by matching each of them to the correct function.

(A)  $f^{-1}(x)$

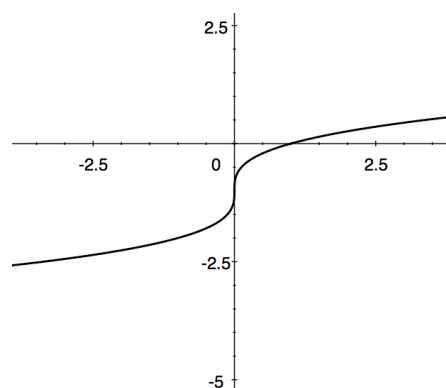
(B)  $-f(x) + 2$

(C)  $-2f^{-1}(x)$

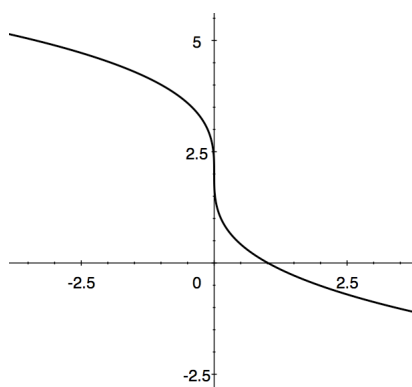
(D)  $\frac{1}{2}f(x)$



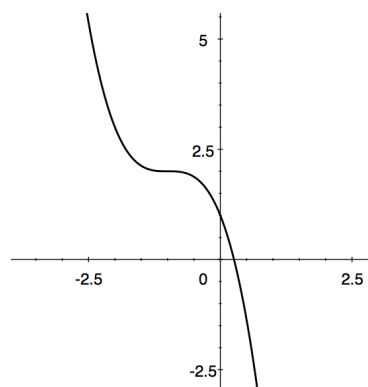
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5. You and some friends go on a hike starting from a camp at the base of a mountain. When you get the top of the mountain you and your friends plant a flag and return home. The function  $f(t) = -6t^2 + 36t + 126$  gives the altitude, in hundreds of feet, at which your group is  $t$  hours after the start of the hike.

[1 pts]      (a) At what altitude is your base camp?

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[3 pts]      (b) How long does it take your group to reach the top of the mountain?

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[1 pts]      (c) How high is the mountain?