## M119 Final Review Revised for 9th edition, Spring 08 \*Note: Be sure to review material not included on this review as well

- What is the domain of a)  $O(B) = \frac{B^{\#} \ 1}{B^2 \ 9}$  b)  $O(B) = E \ \overline{3B} \ 4$ Find 1(2(B)) where 1(?) = ?<sup>#</sup> ?, 2(B) =  $\frac{B}{B \ 1}$ 1.1 1.
- 2. 1.1
- 3. At a certain factory, the total cost of manufacturing q units during the daily production run is 1.1  $C(q) = q^2 + q + 900$  dollars. On a typical workday, q(t) = 25t units are manufactured during the first t hours of a production run. (a) Express the total manufacturing cost as a function of t. (b) How much will have been spent on production by the end of the third hour? (c) When will the total manufacturing cost reach \$11,000?
- B<sup>#</sup> if B<1 3 if B=1 1 B<sup>#</sup> if B>1 O(B) = 1.2 Sketch and label the graph of 4.
- Find the points of intersection of the following functions:  $C = B^{\$}$ 1.2 5. 8B and C = B
- Since the beginning of the month, a local reservoir has been losing water at a constant rate. On the 1.3 6. 10th of the month the reservoir held 180 million gallons of water, and on the 20th day it held only 168 million gallons. (a) Express the amount of water in the reservoir as a function of the time. (b) How much water was in the reservoir on the 7th day of the month?
- 1.3 7. During the winter, a group of students builds sleds in a converted garage. The rental for the garage is \$550 for the winter, and the material needed to build a sled cost \$15. The sleds can be sold for \$70 apiece. How many sleds must be sold to break even?
- The supply function for the sale of a product at p dollars a unit is  $W(p) \oplus p$  8 and the 1.4 8. demand function is H (p)  $\propto \frac{4340}{p}$ . Find the equilibrium price.

## 1.4, 3.5 9. An open box with a square base and vertical sides is constructed out of 300 cm<sup>#</sup> of tin.

- a) Express the volume of the box as a function of x, an edge of its base.
- b) Use calculus to find the value of x which maximizes the volume and the maximum volume.

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- Find the equation of the line tangent to the curve  $y = x^{\$}$  x at the point where x = -1. 2.2 10.
- Find where the graph of f(x) = 4  $2x^{\#}$  has a horizontal tangent line. 2.2, 2.1 11.
- Differentiate and Simplify: O(B) = B<sup>\$</sup>  $\frac{2}{r} + 2x^{\text{S}\#}$   $\frac{5}{FB}$ 2.2 12. 4

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## M119 – FINAL REVIEW – ANSWERS:

- 1) a) x A -3, 3 b)  $x \frac{4}{3}$
- 2)  $g(h(B)) = \frac{x^{\#}}{(x \ 1)^{\#}} \qquad \frac{B}{B^{"}} \ ce \ \frac{-x}{(x \ 1)^{\#}}$
- 3)  $C[q(t)] = 625t^2 + 25t + 900$ , (b) C(3) =\$6600, (c) after 4 hours



- 6) (a)  $y = \frac{6}{5}x + 192$  million gallons, (b) 183.6 million gallons
- 7)10 sleds
- 8) \$ 70
- 9) a)  $\frac{B(300-B^{\#})}{4}$  b) An x of 10 gives a maximum volume of 500 cm<sup>\$</sup>
- 10) y = 2B #Þ
- 11) (0,4)
- 12) f'(x) =  $3x^{\#}$   $\frac{2}{3}$   $3x^{\hat{1} \#}$   $\frac{5}{2}$