

12th Grade Assignment – Week #20

Group Assignments: *for Tuesday and Thursday*

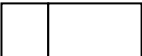
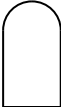
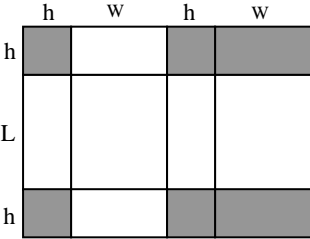
- Do **Problem Set #5** (*Calculus – Part II*), pr #4. Note: This problem is found with last week’s assignment. I will go over this problem in this week’s lecture #2.
- Do **Problem Set #6**, pr #6. I will go over this problem in this week’s lecture #2.
- Do as much as you can with problems #3, 4, 5, and 7 from **Problem Set #6**.

Individual Work

- Finish any of the problems left from the (above) group assignments.
- Do **Problem Set #6**, pr #1, 2

— Calculus – Part II —

Problem Set #6

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| <p>1) Find $\frac{dy}{dx}$.</p> <p>a) $x \sin y + y \cos x = 1$</p> <p>b) $y = 3x^5 - x^3$</p> <p>c) $y = 5x^3y^2$</p> <p>d) $x^3 + y^3 = 1$</p> <p>e) $\ln x = \tan(y^3)$</p> <p>2) Find the equation of the line tangent to the circle $x^2 + y^2 = 25$ at the point $(3, -4)$.</p> <p>3) Sand is being poured into a pile at the rate of 10 cm^3/sec. The pile of sand is always a perfect cone where the ratio of the diameter to the height is 3:2. Find the rate at which the height is increasing when the pile is 30 cm high.</p> <p>4) A plot of land is to be fenced off, using 500 feet of fence, such that it encloses two neighboring sections, as shown below. What are the dimensions of the two plots that produce the greatest area if one plot must be twice the area of the other?</p> <div style="text-align: center; margin: 10px 0;">  </div> <p>5) A window is designed to be a rectangle with a semi-circle on top. What is the width of the window that produces the maximum area given a perimeter of 12 feet?</p> <div style="text-align: center; margin: 10px 0;">  </div> | <p>6) Sarah is standing on a dock pulling in a rowboat. She is pulling in the rope at a constant rate of 3 ft/sec. The rope remains tight the whole time and her hand is 8 feet higher than the point where the rope is tied to the boat.</p> <p>a) As the boat is approaching the dock, how is the (horizontal) speed of the boat changing? Find the speed of the boat when the length of the rope (from the boat to Sarah) is...</p> <p>b) 120 feet.</p> <p>c) 15 feet.</p> <p>7) What are the dimensions of the box (with a top!) having the largest possible volume that can be cut from a piece of paper measuring 6 by 4 inches, given the pattern below?</p> <div style="text-align: center; margin: 10px 0;">  </div> |
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