Wed Oct 26 08:47:58 MDT 2005 /m143.su05/handouts143/t2_143_A26/t2_143_A26

This with-calculator portion of the test consists of just two problems.

1 Compute the average rate of change of the function

$$f(x) = \frac{1}{1+x^2}$$

on the interval $[-1, \sqrt{2}]$. Round your answer to four decimal places.

2 To four decimal places, $\sqrt{\pi + \pi^{2/3}} \approx$ _____

This part of the test has pages 2 – 5. Take a moment to make sure you have them all.

3 Recall the formula

$$\boldsymbol{TI = \frac{f(x+h) - f(x-h)}{2h}}$$

Expand and simplify $\boldsymbol{TI}$ for the case where $\boldsymbol{f(x) = 2x - 3x^2}$.

4 Let $\boldsymbol{f(x) = 3 - 5x}$ and $\boldsymbol{g(x) = 7 - x^2}$.

(a) Simplify $\big(\boldsymbol{f \circ g}\big)\boldsymbol{(x)}$.

(b) Simplify $\big(\boldsymbol{g \circ f}\big)\boldsymbol{(x)}$.

(c) Find a formula for $\boldsymbol{f^{-1}}$.

5 For each of the following, sketch a graph of the equation given. Label important points with their coordinates.

(a) $\boldsymbol{x^2 + y^2 - 6x + 10y = -9}$

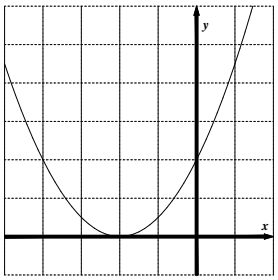
(b) $\boldsymbol{Q(x) = 10 - |x - 5|}$

(c) $\boldsymbol{9x^2 + y^2 = 36}$

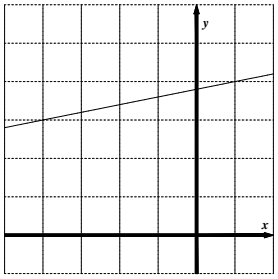
(d) $\boldsymbol{g(x) = 3x^2 - 12x + 21}$

6 Ungraph the following. That is, for each graph, provide a formula for the function or equation whose graph is the most like the given graph:

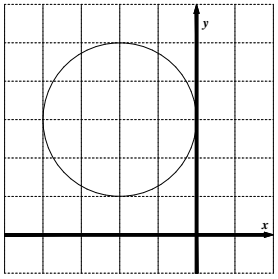
(a)



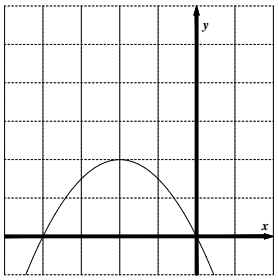
(b)



(c)



(d)



7 Jumbo's Pizzeria can sell **300** five-dollar Little Wonder pizzas on a Saturday evening. For each dollar they boost the price of the Little Wonder, they loose **32** sales.

(a) Give a formula for $\boldsymbol{y}$, the number of LWPs sold on a Saturday evening, in terms of the price $\boldsymbol{x}$.

(b) Determine a formula for the Saturday-evening revenue generated by selling LWPs at price $\boldsymbol{x}$ in dollars.

(c) Show steps in determining the theoretical price of a LWP which maximizes the revenue. Can Jumbo's actually *charge* this theoretical price for a pizza?