← MAT2601_ONL8FA_ONL8F_21 - Calculus, Fall 2021

Week 6 Quiz MAT2601 (Homework)

INSTRUCTOR
Erin Cawley
SOUTH COLLEGE

Current Score

QUESTION	1	2	3	4	5	6	7	8	9	10
POINTS	–/10	–/10	–/10	–/10	–/10	–/10	–/10	–/10	–/10	–/10

TOTAL SCORE

–/100	0.0%

Due Date

TUE, NOV 9, 2021
11:59 PM EST

Request Extension

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by questions. You are required to use a new randomization after every 3 question submissions.

Assignment Scoring

Your best submission for each question part is used for your score.

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1. **[-/10 Points]** DETAILS **HARMATHAP12 11.4.003.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Find dy/dt using the given values.

$$xy = 2 \text{ for } x = 4, dx/dt = -2$$

$$\frac{dy}{dt} = \square$$

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2. **[-/10 Points]** DETAILS **HARMATHAP12 11.4.013.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

The radius of a circle is increasing at a rate of 5 ft/min. At what rate is its area changing when the radius is 2 ft? (Recall that for a circle, $A = \pi r^2$.)

ft^2/min

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3. **[-/10 Points]** DETAILS **HARMATHAP12 11.4.015.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

The volume of a cube is increasing at a rate of 60 in^3/sec. At what rate is the length of each edge of the cube changing when the edges are 8 in. long? (Recall that for a cube, $V = x^3$.)

[ ] in/sec

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4. **[-/10 Points]** DETAILS **HARMATHAP12 11.4.020.MI.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

The supply function for a product is given by $p = 40 + 100\sqrt{2x + 41}$, where x is the number of units supplied and p is the price in dollars. If the price is increasing at a rate of \$1 per month, at what rate (units/month) is the supply changing when the price per unit is \$940?

[ ] units/month

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5. **[-/10 Points]** DETAILS **HARMATHAP12 11.4.028.MI.** 0/15 Submissions Used

MY NOTES | ASK YOUR TEACHER

For a certain animal, the surface area S of the body is related to the body's weight W according to

$$S = kW^{2/3}$$

where k is a constant. Find the percent rate of change of the body's surface area in terms of the percent rate of change of the body's weight.

$\frac{1}{S}\frac{dS}{dt} =$

$\left(\frac{dW}{dt}\right)$

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6. **[-/10 Points]** DETAILS **HARMATHAP12 11.5.002.** 0/15 Submissions Used

MY NOTES | ASK YOUR TEACHER

In this problem, p is in dollars and q is the number of units.

(a) Find the elasticity of the demand function $2p + 3q = 108$ at the price $p = 18$.

(b) How will a price increase affect total revenue?

- ○ Since the demand is elastic, an increase in price will increase the total revenue.
- ○ Since the demand is inelastic, an increase in price will increase the total revenue.
- ○ Since the demand is elastic, an increase in price will decrease the total revenue.
- ○ Since the demand is inelastic, an increase in price will decrease the total revenue.
- ○ Since the demand is unitary, there will be no change in the revenue with a price increase.

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7. **[-/10 Points]** DETAILS **HARMATHAP12 11.5.004.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

In this problem, p is in dollars and q is the number of units.

(a) Find the elasticity of the demand function $pq = 40$ at $p = 5$.

(b) How will a price increase affect total revenue?

- ○ Since the demand is inelastic, an increase in price will decrease the total revenue.
- ○ Since the demand is unitary, there will be no change in the revenue with a price increase.
- ○ Since the demand is inelastic, an increase in price will increase the total revenue.
- ○ Since the demand is elastic, an increase in price will increase the total revenue.
- ○ Since the demand is elastic, an increase in price will decrease the total revenue.

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8. **[-/10 Points]** DETAILS **HARMATHAP12 11.5.008.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

In this problem, p is in dollars and q is the number of units.

Suppose that the demand for a product is given by $(p + 4)\sqrt{q + 9} = 1920$.

(a) Find the elasticity when $p = \$76$. (Round your answer to two decimal places.)

(b) Tell what type of elasticity this is.

- ○ Demand is elastic.
- ○ Demand is inelastic.
- ○ Demand is unitary.

(c) How would a price increase affect revenue?

- ○ An increase in price increases revenue.
- ○ An increase in price decreases revenue.
- ○ Revenue is unaffected by price.

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9. **[-/10 Points]** DETAILS **HARMATHAP12 11.5.015.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

In this problem, p is the price per unit in dollars and q is the number of units.

If the weekly demand function is $p = 126 - q$ and the supply function before taxation is $p = 18 + 8q$, what tax per item will maximize the total revenue?

$ /item

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10. **[–/10 Points]** DETAILS **HARMATHAP12 11.5.021.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

In this problem, p is the price per unit in dollars and q is the number of units.

Suppose the weekly demand for a product is given by $p + 2q = 840$ and the weekly supply before taxation is given by $p = 0.02q^2 + 0.55q + 7.4$. Find the tax per item that produces maximum tax revenue. (Round your answer to the nearest cent.)

$ [ ]

Find the tax revenue. (Round your answer to the nearest whole dollar.)

$ [ ]

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