← MAT2601_ONL8FA_ONL8F_21 - Calculus, Fall 2021

Week 8 Homework MAT2601 (Homework)

INSTRUCTOR
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Current Score

QUESTION	1	2	3	4	5	6	7	8	9	10	11	12	13
POINTS	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25	–/6.25

TOTAL SCORE

–/100	0.0%

Due Date

TUE, NOV 23, 2021
11:59 PM EST

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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.

1. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.4.001.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Cost, revenue, and profit are in dollars and x is the number of units.

If the daily marginal cost for a product is $\overline{MC} = 4x + 130$, with fixed costs amounting to \$900, find the total cost function for each day.

$C(x) =$

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2. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.4.004.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Cost, revenue, and profit are in dollars and x is the number of units.

If the marginal cost for a product is $\overline{MC} = 2x + 70$ and the total cost of producing 10 units is \$1000, find the cost of producing 40 units.

\$ [ ]

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3. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.4.009.MI.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Cost, revenue, and profit are in dollars and x is the number of units.

Suppose that the marginal revenue for a product is $\overline{MR} = 900$ and the marginal cost is $\overline{MC} = 30\sqrt{x + 4}$, with a fixed cost of \$600.

(a) Find the profit or loss from the production and sale of 5 units.

There is a ---Select--- of \$ [ ].

(b) How many units will result in a maximum profit?

[ ] units

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4. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.4.012.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Cost, revenue, and profit are in dollars and x is the number of units.

The average cost of a product changes at the rate

$$\overline{C}'(x) = \frac{-20}{x^2} + \frac{1}{10}$$

and the average cost of 10 units is \$70.00.

(a) Find the average cost function.

$\overline{C}$ =

(b) Find the average cost of 30 units. (Round your answer to two decimal places.)

\$ [ ]

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5. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.4.015.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

If consumption is \$6 billion when disposable income is \$0, and if the marginal propensity to consume is 0.70, find the national consumption function $C(y)$ (in billions of dollars).

$C(y)$ =

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6. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.4.024.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Suppose that the marginal propensity to save is

$$\frac{dS}{dy} = 0.29 \quad \text{(in billions of dollars)}$$

and that consumption is \$8.1 billion when disposable income is \$0. Find the national consumption function.

$C(y) =$

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7. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.4.501.XP.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Suppose that the marginal propensity to consume is

$$\frac{dC}{dy} = 0.03 + \frac{\ln(y+1)}{y+1} \quad \text{(in trillions of dollars)}$$

and that consumption is \$6.08 trillion when disposable income is \$0. Find the national consumption function.

$C(y) =$

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8. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.5.001.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Is $y = x^2$ a solution to $6y - 3xy' = 0$?

- ○ Yes
- ○ No

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9. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.5.003.EP.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Consider the following.

$$2y\,dx - x\,dy = 2\,dx$$

Solve for $\frac{dy}{dx}$.

$\frac{dy}{dx} =$

Is $y = 3x^2 + 1$ a solution to $2y\,dx - x\,dy = 2\,dx$?

- ○ Yes
- ○ No

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10. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.5.011.MI.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Find the particular solution.

$$y' = e^{x-8}; \quad y(0) = 9$$

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11. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.5.017.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Find the general solution to the given differential equation. (Use C for the constant of integration.)

$$dx = x^7 y\,dy$$

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12. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.5.024.MI.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Find the general solution to the given differential equation. (Use C for the constant of integration.)

$$\frac{dy}{dx} = \frac{x^2 + x}{y + 5}$$

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13. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.5.028.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Find the general solution to the given differential equation. (Use C for the constant of integration. Remember to use absolute values where appropriate.)

$$e^{4x}(y + 1)\,dx + e^{2x}y\,dy = 0$$

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14. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.5.030.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Find the particular solution to the differential equation. (Remember to use absolute values where appropriate.)

$$\frac{dy}{dx} = \frac{x + 8}{xy} \quad \text{when } x = 1,\ y = 4$$

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15. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.5.031.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Find the particular solution to the differential equation.

$4y^2\,dx = 6x^2\,dy$ when $x = 4$, $y = -2$

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16. **[-/6.25 Points]** DETAILS **HARMATHAP12 12.5.045.** 0/15 Submissions Used

MY NOTES ASK YOUR TEACHER

Suppose that in a certain company, the relationship between the price per unit p of its product and the weekly sales volume y, in thousands of dollars, is given by

$$\frac{dy}{dp} = -\frac{3}{5}\left(\frac{y}{p+9}\right).$$

Solve this differential equation if $y = 8$ when $p = \$23$.

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