

Practice Quiz 4

MTH U121

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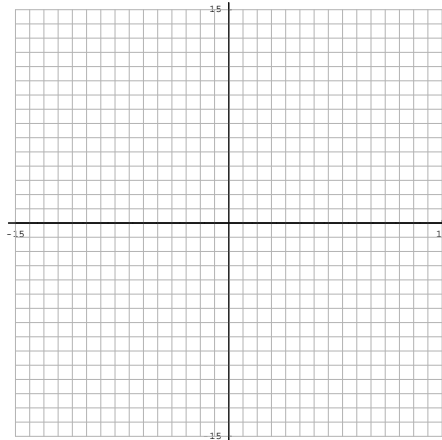
Name _____

1a. Sketch the graph of $y = \frac{2x^2}{25} - \frac{4x}{5} - 6$. Indicate the points found below on the graph.

b. Find the y -intercept.

c. Find the vertex.

d. Find the x -intercepts (if any).



2. A student group is raising money by importing and selling computerized notebook covers. Currently they are selling 10,000 at \$7 each. A business student does a marketing study and determines that for every 1 dollar increase in the price, there will be a 500 decrease in sales.

a. Find a (quadratic) function that models the revenue in terms of the price.

b. What price is so high that no revenue is generated?

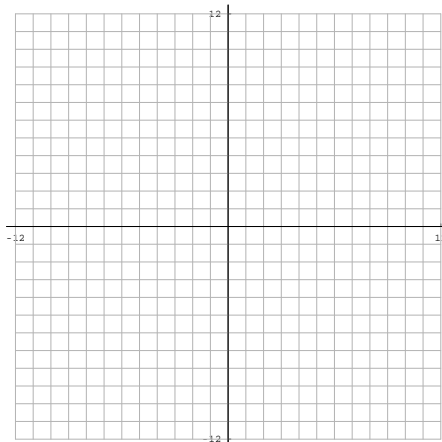
c. Find that price that maximizes the revenue and determine the maximum revenue.

3a. Sketch the graph of $y = -\frac{x^2}{2} + 2x + 2$. Indicate the points found below on the graph.

b. Find the y -intercept.

c. Find the vertex.

d. Find the x -intercepts (if any).



4. A student group is manufacturing and selling digital sundials. The materials for each sundial cost \$8 a piece. The students are selling 60 sundials a week at \$12 each. A carefully done survey indicates that for every dollar increase in price the number of sales per week will decrease by three.

a. Find a quadratic formula (in the form $ax^2 + bx + c$) for the profit as a function of the price.

b. Find that price that maximizes the profit and determine the maximum profit.

c. The students decide they don't want to work too hard and only need a profit of 324 dollars. What price(s) yield this profit? What is the smallest amount they can manufacture and sell in order to have this profit?

ANSWERS: 1) b) $(0, -6)$, c) $(5, -8)$, d) $x = -5, 15$; 2) a) $13500P - 500P^2$ b) \$27. c) \$13.5, \$91125.00;
3) b) $(0, 2)$, c) $(2, 4)$, d) $x = 2 \pm 2\sqrt{2} = -0.828427, 4.82843$; 4: a) $-3P^2 + 120P - 768$, b) \$20, \$432, c) \$14, \$26, manufacture 18;

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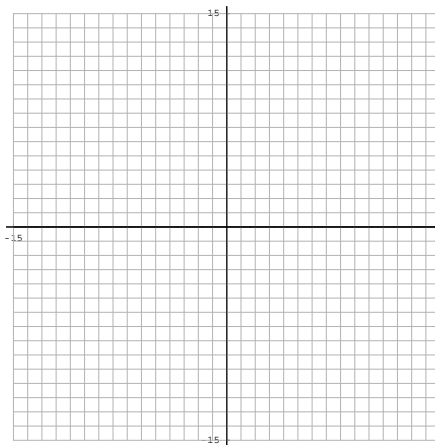
Name

5a. Sketch the graph of $y = -\frac{11x^2}{49} - \frac{110x}{49} + \frac{264}{49}$. Indicate the points found below on the graph.

b. Find the y -intercept.

c. Find the vertex.

d. Find the x -intercepts (if any).



6. A student group is raising money by importing and selling computerized notebook covers. Currently they are selling 40,000 at \$3 each. A business student does a marketing study and determines that for every 1 dollar increase in the price, there will be a 1000 decrease in sales.

a. Find a (quadratic) function that models the revenue in terms of the price.

b. What price is so high that no revenue is generated?

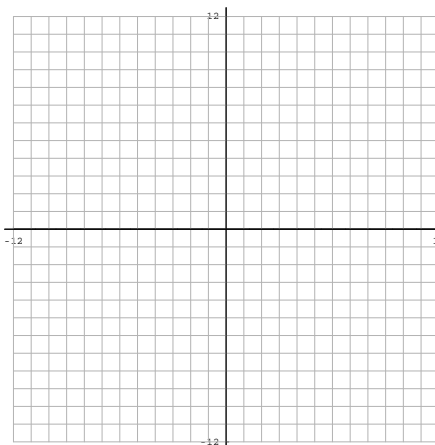
c. Find that price that maximizes the revenue and determine the maximum revenue.

7a. Sketch the graph of $y = \frac{x^2}{3} + 2x - 3$. Indicate the points found below on the graph.

b. Find the y -intercept.

c. Find the vertex.

d. Find the x -intercepts (if any).



8. A student group is manufacturing and selling digital sundials. The materials for each sundial cost \$2 a piece. The students are selling 68 sundials a week at \$16 each. A carefully done survey indicates that for every dollar increase in price the number of sales per week will decrease by two.

a. Find a quadratic formula (in the form $ax^2 + bx + c$) for the profit as a function of the price.

b. Find that price that maximizes the profit and determine the maximum profit.

c. The students decide they don't want to work too hard and only need a profit of 864 dollars. What price(s) yield this profit? What is the smallest amount they can manufacture and sell in order to have this profit?

ANSWERS: 5) b) $(0, \frac{264}{49})$, c) $(-5, 11)$, d) $x = -12, 2$; 6) a) $43000P - 1000P^2$ b) \$43. c) \$21.5, \$462250.00; 7) b) $(0, -3)$, c) $(-3, -6)$, d) $x = -3 \pm 3\sqrt{2} = -7.24264, 1.24264$; 8: a) $-2P^2 + 104P - 200$, b) \$26, \$1152, c) \$14, \$38, manufacture 24;