Whatever you don’t finish in class today will need to be finished on your own time, so get to work!

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1) Identify all the key parts of the following parabolas: ➅ each.

a)



|  |  |
| --- | --- |
| Vertex |  |
| x-intercepts |  |
| y-intercept |  |
| Axis of Symmetry |  |
| Direction of Opening |  |
| Max or Min Value |  |

b)



|  |  |
| --- | --- |
| Vertex |  |
| x-intercepts |  |
| y-intercept |  |
| Axis of Symmetry |  |
| Direction of Opening |  |
| Max or Min Value |  |

2) Try and make a sketch of the following parabolas given the equation in vertex form: ➃ each.

a) $y=(x+6)^{2}-5$ b) $y=2(x-2)^{2}-6$

Vertex: Vertex:

Step Pattern: Step Pattern:

c) $y=2(x+5)^{2}$ d) $y=0.5(x+4)^{2}+2$

Vertex: Vertex:

Step Pattern: Step Pattern:

3) Find the equation of the parabola with a vertex of (2, 5) through the point (4, 1). ➄

|  |  |  |
| --- | --- | --- |
| Vertex Form: | $$y=a(x-h)^{2}+k$$ | Sketch: |
| Sub in Vertex: |  |
| Sub in Point: |  |
| Square and Solve: |  |
| Equation:Equation: $y=\\_\\_\\_\\_(x \\_\\_\\_\\_\\_)^{2} \\_\\_\\_\\_\\_$ |

4) Find the equation of the parabola with a vertex of (-2, 2) through the point (0, 6). ➄

|  |  |  |
| --- | --- | --- |
| Vertex Form: | $$y=a(x-h)^{2}+k$$ | Sketch: |
| Sub in Vertex: |  |
| Sub in Point: |  |
| Square and Solve: |  |
| Equation:Equation: $y=\\_\\_\\_\\_(x \\_\\_\\_\\_\\_)^{2} \\_\\_\\_\\_\\_$ |

5) The school store is now selling t-shirts, and needs to decide on a price. Their goal is to maximize the amount of money they make per month.

You know this bit of market research:

*“If you charge $20 per t-shirt, you normally sell 30 every month. Every time you increase the price by $1, you sell one less t-shirt per month. Every time you decrease the price by $1, you sell one more t-shirt per month.”*

The question you need to ask is “What price should you charge per t-shirt in order to make the most money possible?

a) Fill in the table below to find out (Mr. Smith has started it for you). ➃

|  |  |  |
| --- | --- | --- |
| Price per T-shirt | Number of T-shirts sold per month | Total money made per month(1st × 2nd columns) |
| $17 |  |  |
| $18 |  |  |
| $19 | 31 | 31 × $19 = $589 |
| $20 | 30 | 30 × $20 = $600 |
| $21 | 29 | 29 × $21 = $609 |
| $22 |  |  |
| $23 |  |  |
| $24 |  |  |
| $25 |  |  |
| $26 |  |  |
| $27 |  |  |
| $28 |  |  |

b) How much should you charge per t-shirt to maximize how much money is made? ➀

6) Mr. Smith’s dog Rosie launches off the bed, through the air to get a treat that Mr. Smith tossed. Her height above the ground can be modelled by the equation

h = -5(t – 0.4)2 + 1.7

Where h is in metres, and t is in seconds.

a) What is the vertex of the relation described above? ➁

b) Fill in the blanks. Rosie reaches a maximum height of \_\_\_\_\_\_\_\_\_\_ meters after \_\_\_\_\_\_\_ seconds. ➁

7) Create a table of values for the following relation: $y=(x-2)(x-4)$ and sketch the relation on the graph provided: ➄

|  |  |  |
| --- | --- | --- |
| x | $$y=(x-2)(x-4)$$ | Point |
| 0 | y = (0 – 2)(0 – 4) = 8 | (0, 8) |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |

Note: We will be investigating relations of this form tomorrow!