First Name _____ Last Name _____ Date ___ – ___ – ___ Period ____ Score ____

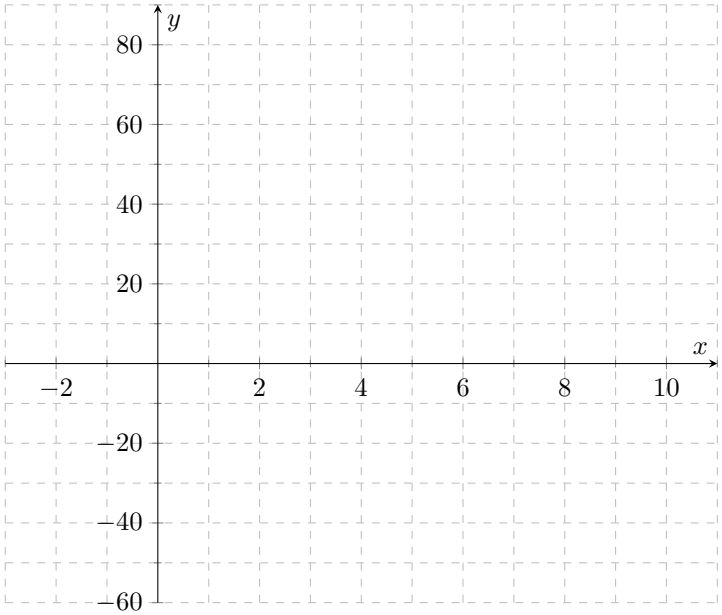
MODEL	Integrating	Applying	Practicing	Acquiring	Awaiting Evidence
I can use math to model and solve real-world problems.	Correctly identifies important quantities and illustrates their relationships using diagrams, tables, graphs, or formulas. Appropriate work is shown with no errors. The answer includes units and rounding as appropriate to the problem. Explains how the answer makes sense in the context of the problem.	Correctly identifies important quantities and illustrates their relationships using diagrams, tables, graphs, or formulas. Appropriate work is shown with no errors. The answer includes units and rounding as appropriate to the problem.	Correctly identifies important quantities and illustrates their relationships using diagrams, tables, graphs, or formulas. Appropriate work is shown with 1 COMPUTATIONAL or ROUNDING error.	Correctly identifies important quantities and attempts to illustrate their relationships using diagrams, tables, graphs, or formulas Appropriate work is shown with 1 CONCEPTUAL error.	Correctly identifies important quantities and attempts to illustrate their relationships using diagrams, tables, graphs, or formulas Appropriate work is shown with more than 1 conceptual error.
Criteria					

Problems.

1. A manufacturer of sweatshirts finds that profits and costs fluctuate depending on the number of products created. Creating more products doesn't always increase profits because it requires additional costs, such as building a larger facility or hiring more workers. The manufacturer determines the profit, $p(x)$, in thousands of dollars, as a function of the number of sweatshirts sold, x, in thousands. This function, p, is given below.

$$p(x) = -x^3 + 9.5x^2 - 4x - 38$$

Graph $y = p(x)$ over the interval $0 \leq x \leq 9$ on the set of axes below.



Over the given interval, state the coordinates of the maximum of p and round all values to the nearest integer. **Explain what this point represents in terms of the number of sweatshirts sold and profit.**

BE PRECISE	Integrating	Applying	Practicing	Acquiring	Awaiting Evidence
I can calculate accurately and efficiently, and be precise in all of my math.	Selects and applies the correct procedure and solves all routine AND integrating problems. AND Expresses the answer to the correct level of precision needed for the problem (including the correct rounding, units, math symbols, labeling, graphing, vocab. . .)	Selects and applies the correct procedure and solves all routine problems. AND Expresses the answer to the correct level of precision needed for the problem (including the correct rounding, units, math symbols, labeling, graphing, vocab. . .)	Selects and applies the correct procedure and solves most routine problems. AND Expresses the answer to the correct level of precision needed for the problem (including the correct rounding, units, math symbols, labeling, graphing, vocab. . .)	Selects and applies the correct procedure and solves some routine problems. AND Attempts to express the answer to the correct level of precision needed for the problem (including the correct rounding, units, math symbols, labeling, graphing, vocab. . .).	Selects and attempts to apply the correct procedure for some routine problems.
Criteria					

2. Suppose x is the width of a rectangle with length 10. The perimeter of the rectangle can be expressed as $P(x) = 2x+20$. Find the domain and range of this perimeter function $P(x)$.

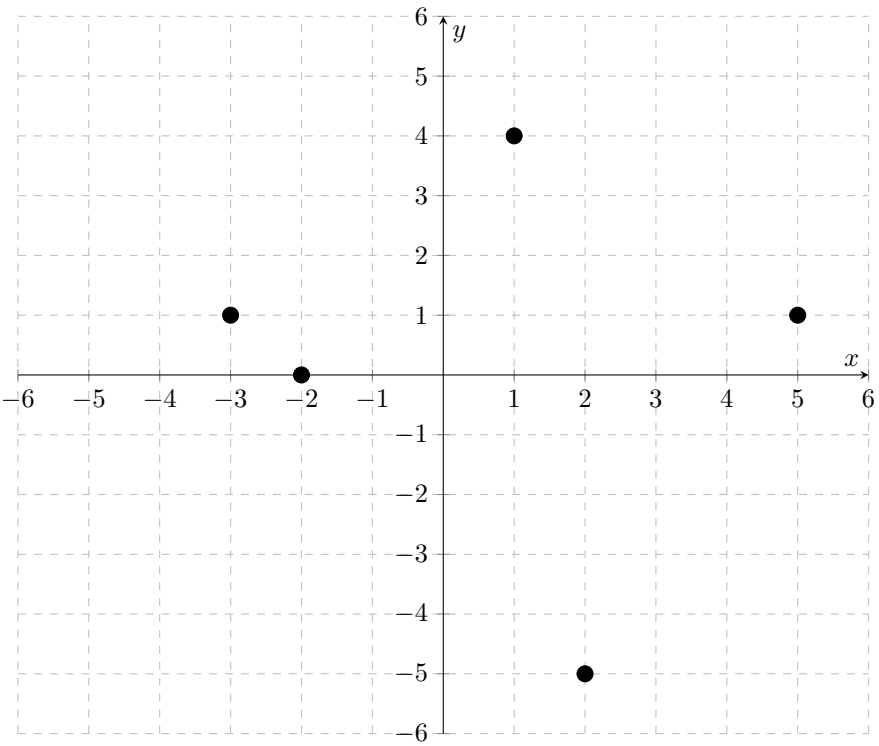
   - Domain: _____
   - Range: _____

3. Find the domain and range from these points (written in set notation).

   (a) $\{(12,5),(3,67),(7,9),(0,3),(-1,3)\}$

   - Domain: {_____}
   - Range: {_____}

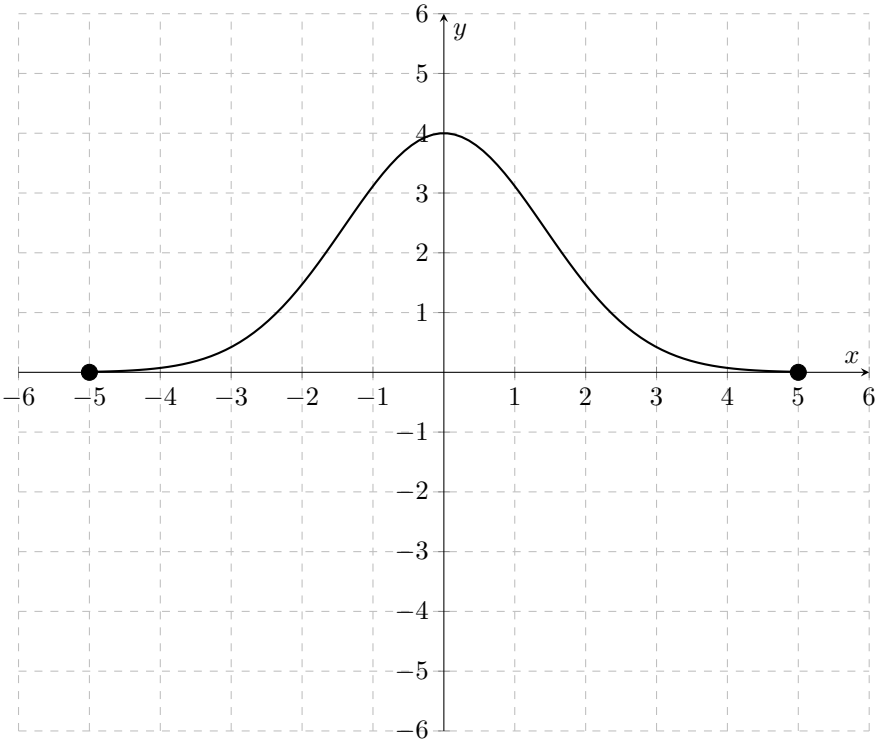
   (b)



   - Domain: {_____}
   - Range: {_____}

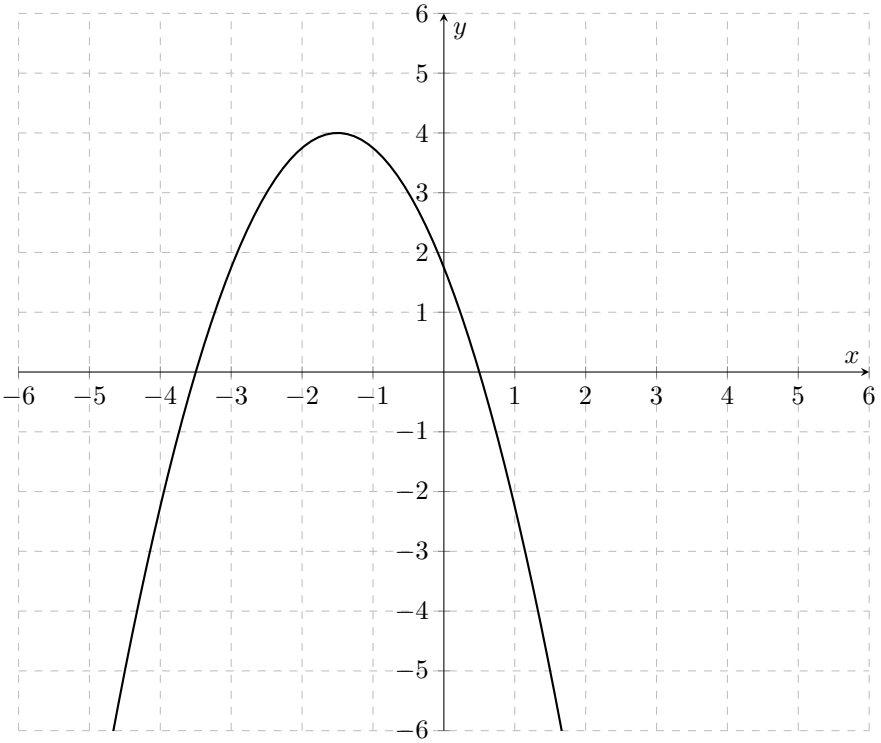
4. Find the domain and range from a graph. Write them in interval notation or as an inequality.

(a)



- Domain: _____
- Range: _____

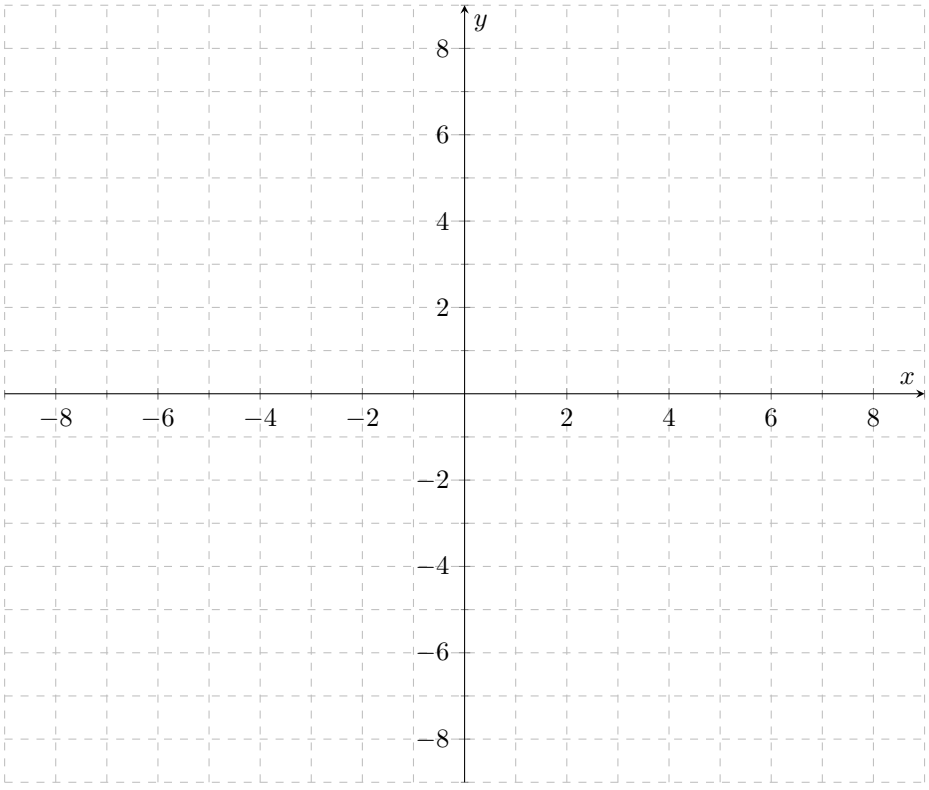
(b)



- Domain: _____
- Range: _____

5. Sketch functions that match the given domain and range.

(a) Domain: $-8 \leq x \leq 3$, Range: $-1 \leq y \leq 5$



(b) Domain: $-\infty < x < \infty$, Range: $0 \leq y < \infty$