

Name: _____

Math 141 – Quiz 5

Score: ____/____

To receive full credit, clear and correct work as discussed in class must be shown for each problem unless otherwise indicated. Only answers to applications should be given as decimals, and these answers should be correctly rounded to at least two decimal places when reasonable. Units should always be included with answers. Any variable used when solving applications should be clearly defined. Work on scratch paper will not be graded. Put all work you want graded on the test and all answers on the answer blank.

1. As ice transitions into an ice-water mixture, it contracts over a certain temperature interval, and then expands as it warms up and becomes pure liquid water. The whole process happens between 0°C and 10°C. The following equation describes the behavior of water between these temperatures.

$$V(T) = 130(T - 4)^2 + 18,015,800 \quad \text{where } T = \text{the temperature in degrees Celsius and} \\ V = \text{the molar volume of water in m}^3/\text{mole}$$

- a) Find the vertical intercept by hand and interpret its meaning. **Intercept:**

explain: (,)

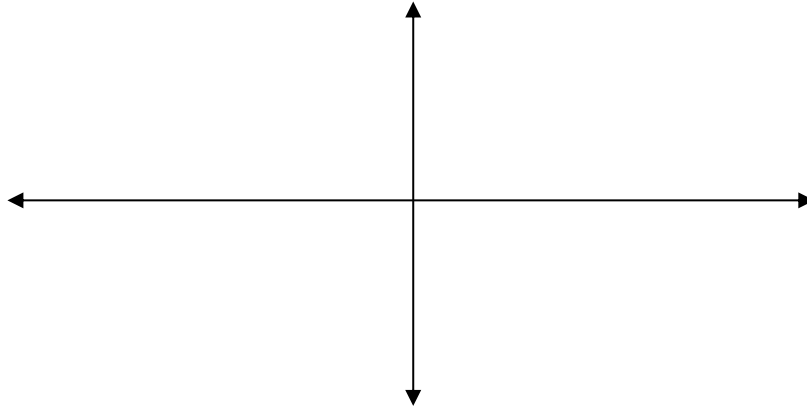
- b) Determine the temperature at which water reaches its minimum molar volume.

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2. Tara is having her annual charity bake sale, and is trying to decide the best price for cupcakes. In the past she has noticed that increasing her price by 2 cents will cause her sales to decrease by about 25 cupcakes. Last year she set her price at 40 cents per cupcake and sold 250. What price should Tara charge this year in order to maximize proceeds from the bake sale?
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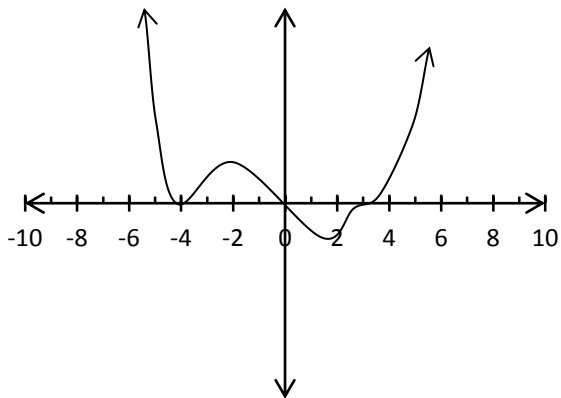
3. Let $f(x) = (12 - x)(x + 20)^2(x - 25)^3$

a) What is the degree of f ? _____

b) Sketch $y = f(x)$. Label all x -intercepts. Be sure to clearly show global behavior and behavior near x -intercepts.



4. The graph of an n^{th} degree polynomial is shown below. Write a possible equation for the polynomial.



Write a possible equation for the polynomial.

$y =$ _____