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Interpreting nonlinear expressions

1.The following equation shows the height, *h*, in meters above the ground of a football *t* seconds after a particular kick.

$$h = 0.3 + 5.5t - 4.9t^2$$

What was the height of the football at the moment of the kick?

2.$F(t) = 1{,}500\,(1.045)^t$

The future value, F(t), of an investment after t years is given by the function defined above. What is the initial value of the investment?

3.$R(q) = -0.31(q - 260)^2 + 18{,}500$

A shoe manufacturer determines that its monthly revenue, R(q), in dollars, is given by the function defined above, where q is the number of pairs of shoes sold each month. What is the maximum value of the company's monthly revenue?

4. $m=0.031x2-0.09x+181.5$ Mehmet experimented with the number of grams (g) of sugar that would dissolve in a specific volume of water at different temperatures. He modeled his results using the above equation to represent the number of grams, m, of sugar that dissolved when the water was x degrees Celsius (°C). What is the best interpretation of the 181.5 in Mehmet's equation?

A. In his experiment, a maximum of 181.5g of sugar dissolved in the water.
B. In his experiment, 0g of sugar dissolved when the water temperature was 181.5°C.
C. In his experiment, when the water temperature was 0°C, 181.5g of sugar dissolved.
D. In his experiment, the maximum number of grams of sugar dissolved when the water temperature was 181.5°C.

5.Wilma created the following formula to model the distance, d, in inches above the floor of her jump after t seconds had passed.

$d=144t(0.5-t)$

What is the best interpretation of the number 0.5 in this equation?

A. Wilma jumped from an initial height of 0.5 inches.
B. Wilma landed on the ground 0.5 seconds after she jumped.
C. Wilma jumped with an initial velocity of 0.5 inches per second.
D. Wilma's jump reached a maximum distance of 0.5 inches above the floor.

6.The equation below models the height, h, in feet above the water for a cable in a suspension bridge at a horizontal distance, x, in feet from the beginning of the span.

$h=0.0002(x-1{,}955)2+100$

How many feet above the water is the lowest point on the cable?

7.P(s)=−(s−a)2+b
The Yerkes-Dodson law predicts that the relationship between stress level, s, and performance, P(s), of a difficult task can be modeled by a function of the form shown above, where a and b are constants related to the measures of stress and performance for a particular task. What is the best interpretation of a in this context?

A. a is the level of stress at which performance is minimal.
B. a is the level of peak performance.
C. a is the level of stress at which performance is maximal.
D. a is the level of stress at which performance is $\frac{1}{2}$ of maximal performance.

8.F(t)= $(0.95)^{\frac{t}{2}}$

The function F(t) defined above gives the percentage of information Dianna retained t days after memorizing lines for a play. Assuming she did not work on her lines again, what is the best description of 0.95 in this context?

A. Dianna will forget 95% of what she retained one day ago.
B. Dianna will forget 95% of what she retained two days ago.
C. Dianna will remember 95% of what she retained one day ago.
D. Dianna will remember 95% of what she retained two days ago

9.The amount of water vapor, v (in grams), that will saturate 1 kilogram of dry air when the temperature is d degrees Celsius is approximated by the following equation.

$v = 4.04 \cdot 1.07^x$

For each increase of 1 degree, what is the percent increase in the amount of water vapor required to saturate the air according to this model?

(Do not type the percent sign.)

10.P(t)=400(1.5)t
Biologists stocked a lake with a new species of fish. The number of the new species of fish in the lake, P(t), t years after being stocked, is shown above. How many fish did the biologists initially add to the lake?

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Thanks

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