Unit04-06-SampleQuiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. The height of the corn stalk in inches over the first 8 weeks of growth could be roughly modeled by the function

\[ h(t) = 2(1.6^t) \]

where \( t \) is measured in weeks.

On which week of growth would the corn stalk grow to 21 inches?

a. week 1  
b. week 3  
c. week 4  
d. week 5

2. At Generic Middle School, 8 students were sick with the flu on the first day of school. By the end of the first week 12 students were sick and by the end of the 2nd week there were 18 students sick. The attendance clerk noticed that the number of students getting sick was growing exponentially with a growth factor of ‘1.5’.

A function model that describes the number that have gotten sick would \( S(x) = 8 \cdot (1.5)^x \), where \( x \) is the number of weeks completed at school.

Using the model, how many students could be expected to have been sick by the end of the 6th week?

a. approximately 41 students  
b. approximately 205 students  
c. approximately 91 students  
d. approximately 72 students
3. A population of chipmunks doubles every year. Initially, there were 5 chipmunks. A researcher studying the chipmunks created a function to model their population growth: 

\[ P(t) = 5(2^t) \]

where \( t \) is the time in years. The graph of the function is shown.

Which of the below would be the best description of the range of the function?

a. any real number  
b. any integer  
c. any whole number greater than or equal to 0  
d. any whole number greater than or equal to 5

4. A person was monitoring how fast the pressure of a tire dropped after it was punctured by a nail. They noticed that the air pressure could be modeled by

\[ P(t) = 35(0.97^t) \]

where the time, \( t \), was measured in minutes after the nail puncture and \( P(t) \) represented the pressure in PSI.

Which of the below would be the best description of the domain of the function?

a. \( t \geq 0 \)  
b. \( 0 < t \leq 35 \)  
c. any integer greater than 0  
d. any real number
5. A person purchased an ounce of gold for $360 in January of 2000. The value of the gold increased by 15% over the next 10 years. What is the growth factor?

- a. 0.64
- b. 1.36
- c. 0.85
- d. 1.15

6. Each of the functions below model the monetary value of an item. Which is the only that has a growth factor showing the item is increasing in value?

- a. \( a(x) = 90 \left( \frac{1}{4} \right)^x \)
- b. \( b(x) = 215 \left( \frac{5}{4} \right)^x \)
- c. \( c(x) = 73(0.98)^x \)
- d. \( d(x) = 12(0.24)^x \)

7. A local farmer started a chicken coop with initially 4 chickens (1 of which was a rooster). The next month there were a total of 7 chickens counting the chicks. If the same exponential growth rate continues each month, which of the below functions would best model this population growth? (Let \( x \) be the number of months since the farmer started the raising chickens)

- a. \( p(t) = 4 + 7x \)
- b. \( p(t) = 4 + 3x \)
- c. \( p(t) = 4(1.25)^x \)
- d. \( p(t) = 4(1.75)^x \)
After purchasing a home for $160,000, the homeowner noticed the suggested value of her house was depreciating (going down) each year by 5% for at least the 6 years she lived there.

If this trend continues, how much will the house be worth in 8 years to the nearest dollar?

- a. $130,321
- b. $106,147
- c. $111,734
- d. $95,798