Algebra 1 Teachers

# Hair Functions
# (Performance Task)

Created by:
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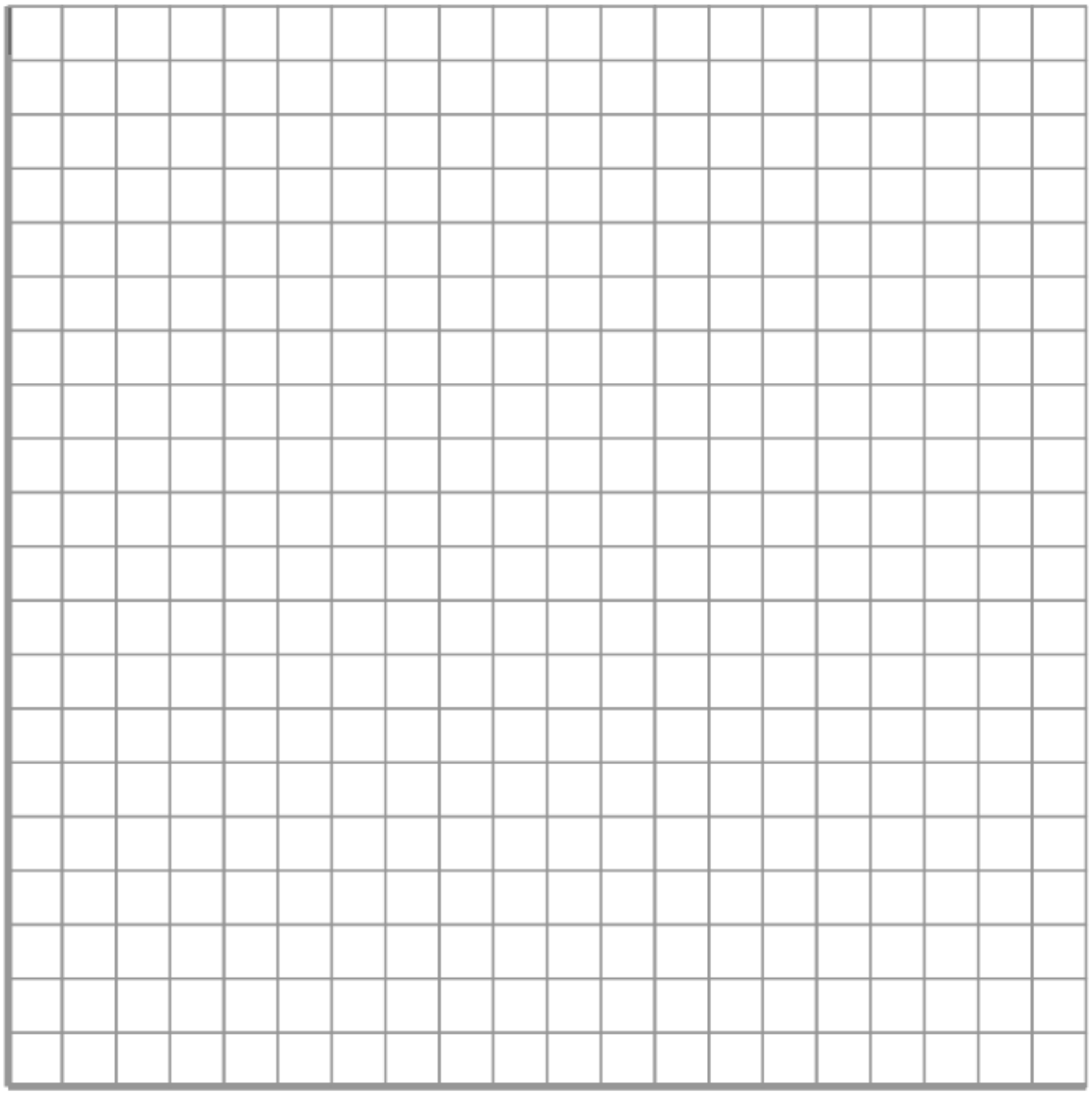
## Hair Functions

*Algebra 1 Teachers Week 2 Performance Task F.IF.1, 2, 7*

**On average, hair grows approximately ½ inch per month.**

a. Write and graph a function that represents hair growth, g, versus time, t, in months. Identify the domain and range of the function.

Function: _____
Domain: _____
Range: _____



b. Identify the type of function in part (a) as linear, exponential, trigonometric, etc. What feature of the graph helps you determine your answer?

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c. How can a hair colorist use the hair growth function to predict when a client may return for a color touch-up? Provide specific examples hair color in your explanations.

d. Suppose on an initial visit to a salon, the length of a woman's hair is 8 ¾ inches long. The stylist trims 1 ½ inches from the length and advises the woman to return every 3 months for a ½ inch trim. Use your graph to predict the length of a woman's hair after 18 months from the initial visit. Show how you determined your answer.

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# Hair Functions: Key

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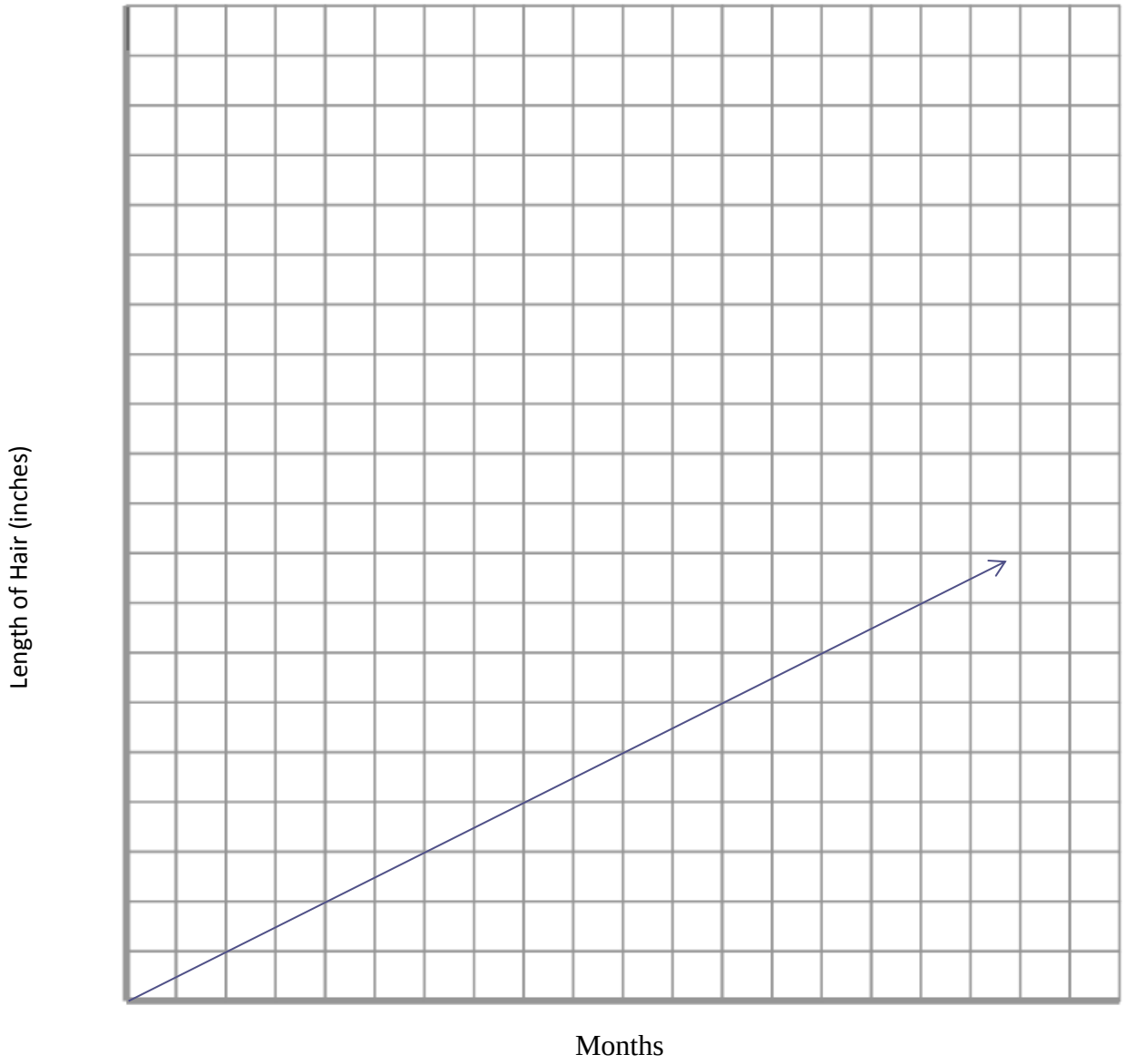
## Hair Functions - Key

*Algebra 1 Teachers Week 2 Performance Task F.IF.1, 2, 7*

**On average, hair grows approximately ½ inch per month.**

a. Write and graph a function that represents hair growth, g, versus time, t, in months. Identify the domain and range of the function.

Function: $g(t) = .5t$
Domain: $t \geq 0$
Range: $g(t) \geq 0$




b. Identify the type of function in part (a) as linear, exponential, trigonometric, etc. What feature of the graph helps you determine your answer?

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The graph is linear because it is a straight line.

c. How can a hair colorist use the hair growth function to predict when a client may return for a color touch-up? Provide specific examples hair color in your explanations.

Vary – Should include how long between colors will be connect to how long the hair grows.

d. Suppose on an initial visit to a salon, the length of a woman's hair is 8 ¾ inches long. The stylist trims 1 ½ inches from the length and advises the woman to return every 3 months for a ½ inch trim. Use your graph to predict the length of a woman's hair after 18 months from the initial visit. Show how you determined your answer.

8.75 +.5(3)-.5 =9.75

So the hair is 1 inch longer every 3 months (9.75-8.75).

18 month divided into 3 month intervals = 6 intervals

8 ¾ + 6 = 14 ¾ inches

Her hair will be 14 ¾ inches long

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| Scoring Guide | | | | | |
|---|---|---|---|---|---|
| **Criteria for Student Learning** | **Percent Weight** | **Below Basic** | **Basic** | **Proficient** | **Exemplary** |
| **Write and graph the function.** | 50 | Student attempts to write function but fails to use f(x) notation. Graph has major errors and/or domain and range are not clearly stated. | Student writes function using f(x) notation and graphs function on a coordinate plane with minor errors. Response attempts to name domain and range of function. | Student writes function using f(x) notation and graphs function on a coordinate plane. Response indicates domain and range of function. | Student writes function using f(x) notation and graphs function on a coordinate plane, properly labeling axes and using appropriate scale. Response indicates domain and range of function. |
| **Identify the function.** | 10 | Response fails to indicate function as linear. | Response attempts to identify function as linear but does not use proper terminology. | Student correctly identifies function as linear. | Student correctly identifies function as linear and provides mathematical evidence to prove identification. |
| **Use the function for prediction of returning color client.** | 20 | Reasoning for prediction conveys limited understanding of function and neither example shows knowledge of client service intervals. | Reasoning for prediction conveys general understanding of function and at least one example shows knowledge of client service intervals. | Reasoning for prediction conveys clear understanding of function and examples show knowledge of client service intervals. | Reasoning for prediction conveys clear understanding of function and examples show knowledge of client service intervals. Explanations include evidence from graph and personal experience. |
| **Use the function to predict hair length.** | 20 | Prediction is unreasonable and not founded in mathematical reasoning or with computations. | Prediction is reasonable but limited documentation is provided to support prediction. | Prediction is based on correct fraction computation. Documentation is provided to support | Prediction is based on correct fraction computation. Result is supported by computation and |