Sec 5.1 – Identifying the Function
Linear, Quadratic, or Exponential Functions

Name:

1. Graphically identify which type of function model might best represent each scatter plot.

2. Match each graph with its description.

   ____ I. An exponential function that is always increasing.

   ____ II. An exponential function that is always decreasing.

   ____ III. A quadratic function with a local maximum.

   ____ IV. A quadratic function with a local minimum.

   ____ V. A linear function that is always increasing.

   ____ VI. A linear function that is always decreasing.
3. Which is the only type of function below that has an asymptote when graphed?
   A. Linear Function    B. Quadratic Function    C. Exponential Function

4. Which is the only type of function below that could have a local maximum?
   A. Linear Function    B. Quadratic Function    C. Exponential Function

5. Describe the end behavior of each of the function below.
   A. 
   ![Graph]
   Name: ________________
   As \( x \to -\infty \), \( f(x) \to \) __________
   As \( x \to \infty \), \( f(x) \to \) __________

   B. 
   ![Graph]
   Name: ________________
   As \( x \to -\infty \), \( g(x) \to \) __________
   As \( x \to \infty \), \( g(x) \to \) __________

   C. 
   ![Graph]
   Name: ________________
   As \( x \to -\infty \), \( h(x) \to \) __________
   As \( x \to \infty \), \( h(x) \to \) __________

6. Which is the only function that might have end behavior such that as \( x \) approaches infinity, \( f(x) \) approaches 4?
   A. Linear Function    B. Quadratic Function    C. Exponential Function

7. Which is the only function below that might have end behavior such that:
   - As \( x \to -\infty \), \( f(x) \to \infty \)
   - As \( x \to \infty \), \( f(x) \to \infty \)
   A. Linear Function    B. Quadratic Function    C. Exponential Function

8. Which is the only function below that might have end behavior such that:
   - As \( x \to -\infty \), \( f(x) \to -\infty \)
   - As \( x \to \infty \), \( f(x) \to \infty \)
   A. Linear Function    B. Quadratic Function    C. Exponential Function

9. Which is the only function below that might have end behavior such that:
   - As \( x \to -\infty \), \( f(x) \to -\infty \)
   - As \( x \to \infty \), \( f(x) \to -\infty \)
   A. Linear Function    B. Quadratic Function    C. Exponential Function
10. Based on the function given identify which description best fits the function.

A. \( f(x) = x(2x + 3) \)  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Growth]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]

B. \( g(x) = 3(1 - 2x) - 4 \)  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Growth]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]

C. \( h(x) = 2 + \left(\frac{1}{2}\right)^x \)  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Growth]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]

D. \( m(x) = 3 \cdot (2)^x + 1 \)  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Growth]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]

E. \( p(x) = 2 - 3x^2 + x \)  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Growth]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]

F. \( q(x) = \frac{1}{2}x - 1 \)  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Growth]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]  
   ![Model (circle one): Linear Growth Quadratic Growth Exponential Decay]

11. Based on the partial set of values given for a function, identify which description best fits the function.

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