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## AIM: USING A TABLE OF VALUES TO IDENTIFY A FUNCTION

Example \# 1: $\qquad$ Function

Rule: Both the $x$ and $y$-values increase by a common $\qquad$ (constant).

Equation:

| $\mathbf{x}$ | $\mathbf{y}$ |
| :--- | :--- |
| 0 | 1 |
| 1 | 4 |
| 2 | 7 |
| 3 | 10 |
| 4 | 13 |
| 5 | 16 |

Example \# 2: $\qquad$ Function

Rule: The $y$-value increases by a common $\qquad$ (factor).

Equation:

| $\mathbf{x}$ | $\mathbf{y}$ |
| :--- | :--- |
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |
| 3 | 8 |
| 4 | 16 |
| 5 | 32 |

Example \# 3: $\qquad$ Function

Rule: The $\qquad$ of differences of the $y$-values has a common difference (constant).

Equation:

| $\mathbf{x}$ | $\mathbf{y}$ |
| :--- | :--- |
| 0 | -1 |
| 1 | 5 |
| 2 | 15 |
| 3 | 29 |
| 4 | 47 |
| 5 | 69 |

$\qquad$ Function

Rule: The $y$-value increases by a $\qquad$ and $\qquad$ common difference

| $\boldsymbol{x}$ | $\boldsymbol{f}(\boldsymbol{x})$ |
| :---: | :---: |
| -3 | 1.5 |
| -2 | 1 |
| -1 | 0.5 |
| 0 | 0 |
| 1 | 0.5 |
| 2 | 1 |
| 3 | 1.5 |

1. Write an exponential equation for the graph shown below. Explain how you determined the equation.

2. Write a quadratic equation for the graph shown below. Explain how you determined the equation.

3. Match each table below to the function and the context, and explain how you made your decision.

| A |  |
| :---: | :---: |
| $\boldsymbol{x}$ | $\boldsymbol{y}$ |
| 1 | 9 |
| 2 | 18 |
| 3 | 27 |
| 4 | 18 |
| 5 | 9 |

Equation $\qquad$

Context $\qquad$

| B |  |
| :---: | :---: |
| $\boldsymbol{x}$ | $\boldsymbol{y}$ |
| 1 | 12 |
| 2 | 24 |
| 3 | 36 |
| 4 | 48 |
| 5 | 60 |

Equation $\qquad$

| C |  |
| :---: | :---: |
| $x$ | $\boldsymbol{y}$ |
| 0 | 160 |
| 1 | 174 |
| 2 | 156 |
| 3 | 106 |
| 4 | 24 |

Equation $\qquad$

| D |  |
| :---: | :---: |
| $x$ | $\boldsymbol{y}$ |
| 1 | 2 |
| 2 | 4 |
| 3 | 8 |
| 4 | 16 |
| 5 | 32 |

Equation $\qquad$

| E |  |
| :---: | :---: |
| $x$ | $y$ |
| 2 | 8 |
| 3 | 9 |
| 4 | 8 |
| 5 | 5 |
| 6 | 0 |

Equation $\qquad$
Context $\qquad$
Context $\qquad$

## Equations:

$f(x)=12 x$
$h(x)=-9|x-3|+27$
$g(x)=-(x)(x-6)$
$p(x)=2^{x}$
$q(x)=-16 x^{2}+30 x+160$

1. The population of bacteria doubled every month, and the total population vs. time was recorded.
2. A ball was launched upward from the top of a building, and the vertical distance of the ball from the ground vs. time was recorded.
3. The height of a certain animal's vertical leap was recorded at regular time intervals of one second; the animal returned to ground level after six seconds.
4. Melvin saves the same amount of money every month. The total amount saved after each month was recorded.
5. Chris ran at a constant rate on a straight-line path and then returned at the same rate. His distance from his starting point was recorded at regular time intervals.
$\qquad$

HW\# $\qquad$
Directions for \#'s 1-3:
(a) Identify which type of function best models the data in each table.
(b) Using your calculator, write an equation to model the data.
1.

| $x$ | $y$ |
| :---: | :---: |
| -2 | 12 |
| -1 | 6 |
| 0 | 3 |
| 1 | 1.5 |
| 2 | 0.75 |

2. 


3.

| $x$ | $y$ |
| :---: | :---: |
| 0 | 0 |
| 1 | -2 |
| 2 | -8 |
| 3 | -18 |
| 4 | -32 |

(a) $\qquad$
(a) $\qquad$
(a) $\qquad$
(b) $\qquad$
(b) $\qquad$
(b) $\qquad$
4. Which function is shown in the table below?

1) $f(x)=3 x$
2) $f(x)=x+3$
3) $f(x)=-x^{3}$

| $\mathbf{x}$ | $\mathbf{f}(\mathbf{x})$ |
| ---: | ---: |
| -2 | $\frac{1}{9}$ |
| -1 | $\frac{1}{3}$ |
| 0 | 1 |
| 1 | 3 |
| 2 | 9 |
| 3 | 27 |

4) $f(x)=3^{x}$
5. The graph of the function $f(x)=\sqrt{x+4}$ is shown below. The domain of the function is
1) $\{x \mid x>0\}$
2) $\{x \mid x \geq 0\}$
3) $\{x \mid x>-4\}$
4) $\{x \mid x \geq-4\}$

6. A laboratory technician studied the population growth of a colony of bacteria. He recorded the number of bacteria every other day, as shown in the partial table below. Which function would accurately model the technician's data?
1) $f(t)=25^{t}$
2) $f(t)=25^{t+1}$

| $\mathbf{t}$ (time, in days) | 0 | 2 | 4 |
| :--- | :---: | :---: | :---: |
| $\mathbf{f ( t )}$ (bacteria) | 25 | 15,625 | $9,765,625$ |

3) $f(t)=25 t$
4) $f(t)=25(t+1)$
7. Which graph represents the solution set of $2 x-5<3$ ?
1) 


2)

3)

4)

8. Multiply: $(x+3)\left(x^{2}+6 x+9\right)$

