

4.7  
p. 327Linear & Non-Linear Functions

\* A function is linear if it has a constant rate of change.

straight line

$$\frac{\Delta Y}{\Delta X}$$

X	2	4	6	8
Y	50	35	20	5

$\overset{+2}{\text{---}}$     $\overset{+2}{\text{---}}$     $\overset{+2}{\text{---}}$   
 $\underset{-15}{\text{---}}$     $\underset{-15}{\text{---}}$     $\underset{-15}{\text{---}}$

Yes, linear

$$\frac{-15}{2} = \frac{-15}{2} = \frac{-15}{2}$$

X	Y
1	2
4	20
7	54
10	104

$\left. \begin{array}{l} +3 \\ +3 \\ +3 \end{array} \right\}$     $\left. \begin{array}{l} +18 \\ +34 \\ +50 \end{array} \right\}$

$$\frac{18}{3} \neq \frac{34}{3} \neq \frac{50}{3}$$

Not linear

X	Y
1	10
4	40
9	90
12	120
20	200

$\left. \begin{array}{l} +3 \\ +5 \\ +3 \\ +8 \end{array} \right\}$     $\left. \begin{array}{l} +30 \\ +50 \\ +30 \\ +80 \end{array} \right\}$

$$\frac{30}{3} = \frac{50}{5} = \frac{30}{3} = \frac{80}{8}$$

$$10 = 10 = 10 = 10$$

YES, linear