PRACTICE

1. A machine manufactures 55 parts in 11 minutes. A newer machine can manufacture the 60 parts in 15 minutes.

    Find the rate and write an equation that models how many parts y each machine can manufacture in any number of minutes x.
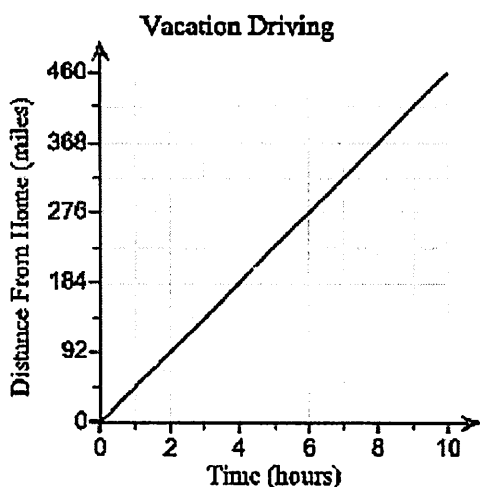
    Old Machine rate _____   New Machine rate _____

    Old Machine equation _____   New Machine equation _____

2. The graph shows a proportional relationship between a family's distance from home, y, and the time they spend driving, x. Write an equation for the relationship shown by the graph.

Vacation Driving

3. Write an equation for the following description:
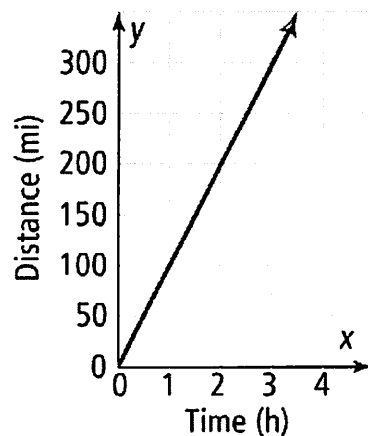
    a. y is three times the value of x.

    b. Twice x minus 7 is y.

4. The graph shows the distance d a train travels in time t at a constant speed r.

a. Write an equation in $d = rt$ form that models the situation shown.

b. Another train can travel 300 miles in 3 hours. Which train travels at a greater rate?

(Graph: y-axis labeled "Distance (mi)" with values 0, 50, 100, 150, 200, 250, 300; x-axis labeled "Time (h)" with values 0, 1, 2, 3, 4; a straight line from origin.)

5. The number of miles Kat walks is represented by the equation $y = 7x$, where x is the number of hours spent walking and y is the number of miles walked. The number of miles Jacob walks in x hours is modeled by the equation $y = 5x$. Who walks faster? Explain.
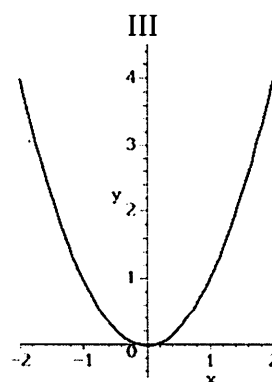
DAILY REVIEW

Which function(s) is linear?

I

$y = -2x$

II

x	y
0	0
2	8
4	16
6	24

III

(Graph: a parabola opening upward with vertex at origin; y-axis marked 1, 2, 3, 4; x-axis marked -2, -1, 0, 1, 2.)

PRACTICE

1. A machine manufactures 55 parts in 11 minutes. A newer machine can manufacture the 60 parts in 15 minutes.

Find the rate and write an equation that models how many parts y each machine can manufacture in any number of minutes x.

Old Machine rate $\underline{\dfrac{55}{11} = 5 \text{ parts per min}}$ New Machine rate $\underline{\dfrac{60}{15} = 4 \text{ parts per min}}$

Old Machine equation $\underline{y = 5x}$ New Machine equation $\underline{y = 4x}$

2. The graph shows a proportional relationship between a family's distance from home, y, and the time they spend driving, x. Write an equation for the relationship shown by the graph.

Vacation Driving
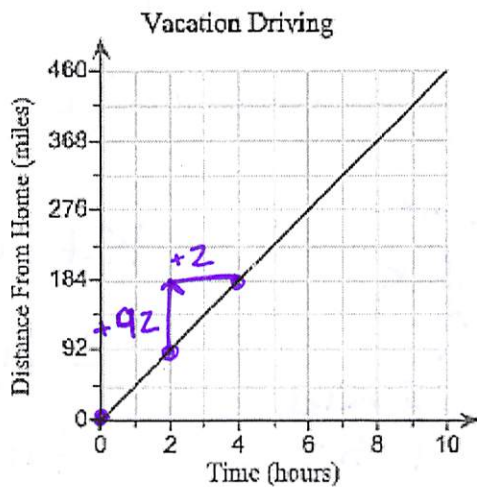
$\dfrac{\Delta y}{\Delta x} = \dfrac{92 \text{ miles}}{2 \text{ hrs}} = \dfrac{46 \text{ miles}}{1 \text{ hr}}$

$y = 46x$

3. Write an equation for the following description:

a. y is three times the value of x.

$y = 3 \cdot x$

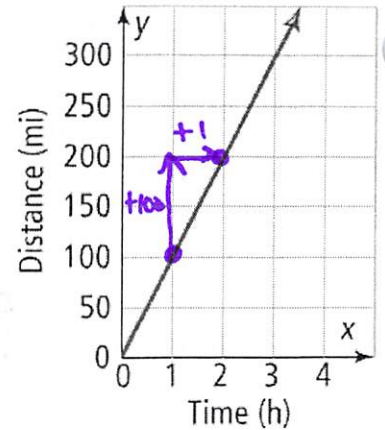b. Twice x minus 7 is y.

$2x - 7 = y$

4. The graph shows the distance d a train travels in time t at a constant speed r.

   a. Write an equation in $d = rt$ form that models the situation shown.

   slope: $\frac{100}{1}$

   $d = 100t$

   [Graph: Distance (mi) vs Time (h), line through origin, with annotations +100 and +1 at point (2, 200) and (2, 100)]

   b. Another train can travel 300 miles in 3 hours. Which train travels at a greater rate?

   $$\frac{300 \text{ miles}}{3 \text{ hrs}} \xrightarrow{\div 3} \frac{100 \text{ miles}}{1 \text{ hr}} \xleftarrow{\div 3}$$

   Same rate

5. The number of miles Kat walks is represented by the equation $y = 7x$, where x is the number of hours spent walking and y is the number of miles walked. The number of miles Jacob walks in x hours is modeled by the equation $y = 5x$. Who walks faster? Explain.

   Kat
   $y = 7x$

   $\frac{\Delta Y}{\Delta x} = \frac{7 \text{ miles}}{1 \text{ hr}}$

   7 mph

   Jacob
   $y = 5x$

   $\frac{\Delta Y}{\Delta x} = \frac{5 \text{ miles}}{1 \text{ hr}}$

   5 mph

   Kat walks
   2 mph
   faster

DAILY REVIEW

Which function(s) is linear?

Ⓘ
$y = -2x$

Ⓘ I

x	y
0	0
2	8
4	16
6	24

+2 { ... } +8 (each)

Constant rate of change = 4

III

[Graph: parabola]