Name _____ Date_____

Problem Solving Using Rates, Unit Rates, and Conversions

A 6^{th} grade math teacher can grade 25 homework assignments in 20 minutes.

Is he working at a faster rate or slower rate than grading 36 homework assignments in 30 minutes?

1. Who walks at a faster rate: someone who walks 60 feet in 10 seconds or someone who walks 42 feet in 6 seconds?

2. Who walks at a faster rate: someone who walks 60 feet in 10 seconds or someone who takes 5 seconds to walk 25 feet? Review the lesson summary before answering.

3. Which parachute has a slower decent: a red parachute that falls 10 feet in 4 seconds or a blue parachute that falls 12 feet in 6 seconds?

4. During the winter of 2012–2013, Buffalo, New York received 22 inches of snow in 12 hours. Oswego, New York received 31 inches of snow over a 15-hour period. Which city had a heavier snowfall rate? Round your answers to the nearest hundredth.

5. A striped marlin can swim at a rate of 70 miles per hour. Is this a faster or slower rate than a sailfish, which takes 30 minutes to swim 40 miles?

6. One math student, John, can solve 6 math problems in 20 minutes while another student, Juaquine, can solve the same 6 math problems at a rate of 1 problem per 4 minutes. Who works faster?

A 6^{th} grade math teacher can grade 25 homework assignments in 20 minutes.

Is he working at a faster rate or slower rate than grading 36 homework assignments in 30 minutes?

$\frac{25}{20}\frac{assignments}{minutes} = \frac{1.25}{1}\frac{assignments}{minute}$ $\quad\quad$ $\frac{36}{30}\frac{assignments}{minutes} = \frac{1.2}{1}\frac{assignments}{minute}$

It is faster to grade 25 assignments in 20 minutes.

1. Who walks at a faster rate: someone who walks 60 feet in 10 seconds or someone who walks 42 feet in 6 seconds?

   $\frac{60}{10}\frac{feet}{seconds} = 6\frac{feet}{second}$

   $\frac{42}{6}\frac{feet}{seconds} = 7\frac{feet}{second}$ → *Faster*

2. Who walks at a faster rate: someone who walks 60 feet in 10 seconds or someone who takes 5 seconds to walk 25 feet? Review the lesson summary before answering!

   $\frac{60}{10}\frac{feet}{seconds} = 6\frac{feet}{second}$ → *Faster*

   $\frac{25}{5}\frac{feet}{seconds} = 5\frac{feet}{second}$

3. Which parachute has a slower decent: a red parachute that falls 10 feet in 4 seconds or a blue parachute that falls 12 feet in 6 seconds?

   Red: $\frac{10}{4}\frac{feet}{seconds} = 2.5\frac{feet}{second}$

   Blue: $\frac{12}{6}\frac{feet}{seconds} = 2\frac{feet}{second}$ → *Slower*

4. During the winter of 2012–2013, Buffalo, New York received 22 inches of snow in 12 hours. Oswego, New York received 31 inches of snow over a 15-hour period. Which city had a heavier snowfall rate? Round your answers to the nearest hundredth.

   $\frac{22}{12}\frac{inches}{hours} = 1.83\frac{inches}{hour}$

   $\frac{31}{15}\frac{inches}{hours} = 2.07\frac{inches}{hour}$ → *Heavier*

5. A striped marlin can swim at a rate of 70 miles per hour. Is this a faster or slower rate than a sailfish, which takes 30 minutes to swim 40 miles?

Marlin: 70 *mph* → *slower*

Sailfish:

$$\frac{40}{30}\frac{miles}{\cancel{minutes}} \times \frac{60}{1}\frac{\cancel{minutes}}{hour} = \frac{2,400}{30}\frac{miles}{hour} = 80\ mph$$

6. One math student, John, can solve 6 math problems in 20 minutes while another student, Juaquine, can solve the same 6 math problems at a rate of 1 problem per 4 minutes. Who works faster?

$$\frac{6}{20}\frac{problems}{minutes} = 0.3\ \frac{problems}{minute} \rightarrow Faster$$

$$\frac{1}{4}\frac{problem}{minutes} = 0.25\ \frac{problems}{minute}$$