

Problem 1 : Kathleen has been tracking how fast she walks over the last month and determined that she walks $1\frac{1}{4}$ miles in $\frac{2}{5}$ of an hour. Lynn has been tracking how fast she walks over the last few weeks and determined that it takes her 19 minutes and 12 seconds to walk 1 mile.
 Part A: Write both Kathleen's and Lynn's walking rate in the same format, either miles per hour, miles per minute, minutes per mile, or hours per mile and compare their rates to each other.

SOLUTION

Kathleen rate:

Miles/hrs

$1\frac{1}{4} = \frac{5}{4}$

Rate = $(\frac{5}{4} \text{ mil}) : (\frac{2}{5} \text{ hrs}) = \frac{5}{4} \times \frac{5}{2} = \frac{25}{8} \text{ mil/hrs}$

Mil/min

$\frac{2}{5} \text{ hrs} = \frac{2}{5} \times 60 \text{ min} = 24 \text{ min}$

Rate = $(\frac{5}{4} \text{ mil}) : (24 \text{ min}) = \frac{5}{4} \times \frac{1}{24} \text{ mil/min} = \frac{5}{96} \text{ mil/min}$

Min/mil

Rate = $24 \text{ min} : (\frac{5}{4} \text{ mil}) = 24 \times \frac{4}{5} \text{ min/mil} = 19.2 \text{ min/mil}$

hrs/mil

Rate = $(\frac{2}{5}) : (\frac{5}{4}) \text{ hrs/mil} = \frac{8}{25} \text{ hrs/mil}$

Lynn's rate

$19 \text{ min } 12 \text{ sec} = 1152 \text{ sec} = \frac{1152}{3600} \text{ hrs} = \frac{8}{25} \text{ hrs}$

Miles/hrs

Rate = $(1 \text{ mil}) / (\frac{8}{25} \text{ hrs}) = \frac{25}{8} \text{ mil/hrs}$

Mil/min

$19 \text{ min } 12 \text{ sec} = 19 \text{ min} + \frac{12}{60} \text{ min} = 19.2 \text{ min}$

Rate = $1 \text{ mil} / 19.2 \text{ min} = \frac{10}{192} \text{ mil/min} = \frac{5}{96} \text{ mil/min}$

Min/mil

Rate = $19.2 \text{ min} / 1 \text{ mil} = 19.2 \text{ min/mil}$

hrs/mil

Rate = $(\frac{8}{25} \text{ hrs}) / (1 \text{ mil}) = \frac{8}{25} \text{ hrs/mil}$

Conclusion: . Kathleen and Lynn have the same rate

Problem 2: Bruce mows lawns for extra money. Mr. Seaver's lawn covers $\frac{1}{2}$ of an acre, and it

takes $\frac{3}{4}$ of an hour to mow. Mr. Brown's lawn covers 16,335 square feet and it takes 35 minutes to mow. One acre is 43,560 square feet.

Part A: Write the rate at which he mowed both lawns in the same format, either hours per acre, minutes per acre, hours per square foot, or minutes per square foot, and compare the rates to each other.

SOLUTION

Firstly we have: $\frac{1}{2} \text{ acre} = \frac{43560}{2} = 21780 \text{ sq feet}$

$\frac{3}{4} \text{ hrs} = \frac{3}{4} \times 60 \text{ min} = 45 \text{ min}$

35 min = 35/60 hrs = 7/12 hrs = 0.583 hrs
16335 sq feet = 16335/43560 acre = 3267/8716 acre = 0.375 acre
The rate of mowing is as follows,

Hours per acre

To Seaver's
Rate = (3/4):(1/2) = 3/4 x 2/1 = 3/2 hrs/acre = 1.5 hrs/acre
To Brown's
Rate = (7/ 12):0.375 = 1.55 hrs/acre > 1.5 hrs/acre

Min/acre

To Seaver's
Rate = (45 min):(1/2 acre) =90 min/acre
To Brown's
Rate = (35 min):0.375 acre = 93.376 min/acre > 90 min/acre

Hours per sq feet

To Seaver's
Rate = (3/4 hrs):(21780 sq feet) =0.75 :21780 = 75: 2178000 hrs/sq feet = 3/87120 hrs/sq feet
To Brown's
Rate = (7/ 12 hrs):16335 sq feet = 7/196020 hrs/sq feet
But, 3/87120= (3x7/3)/(87120x7/3) = 7/203280 < 7/196020

Minutes per sq feet

To Seaver's
Rate = (45 min):(21780 sq feet) = 1/484 min/sq feet
To Brown's
Rate = (35 hrs):16335 sq feet = 7/3267 min/sq feet = 1/466.7 min/sq feet >1/484

Conclusion: In all cases the rate of mowing is higher at Seaver's lawn.//

3. Fill in the blank in the following situations to describe opposite quantities that combine to make zero.

Nick climbed a hill with an elevation of feet. Later that day, he returned home descending 700 feet.

Jacob deposited his paycheck of \$. Later that week, he withdrew the same amount of \$225 to buy a new TV.

Janine was scuba diving and dove 25 feet to look at the fish on the coral reef. She then swam feet to the surface.

The temperature started at -25 degrees. During the day, the temperature rose 5 degrees and then dropped 5 degrees. At the end of the day, the temperature was degrees.

4-A. When the fraction is converted to a decimal, it is a repeating/terminating decimal.

B. When the fraction is converted to a decimal, it is a repeating/terminating decimal.

C. When the fraction is converted to a decimal, it is a repeating/terminating decimal.