Algebra 1 Bellwork Tuesday, February 23, 2016

1. A plane flies round-trip between two cities that are 1200 miles apart. One of the directions takes 4.8 hours because the plane is flying with a tailwind. The other direction takes 6 hours because the plane if flying against a headwind. Write and solve a system of equations to find the speed of the plane and the speed of the wind.

Put answers here:

Equations & work:

Plane speed =

Wind speed =

2. You use your boat on a nearby river to make two trips. You travel downstream 13.5 miles in 1.8 hours. You turn around and travel upstream 7.26 miles in 2.2 hours. Write and solve a system of equations to find the speed of the boat and the speed of the current in the river.

Put answers here:

Equations & work:

Boat speed =

Current speed =

3. After experimenting you've found that the "perfect" mixture for a drink is 23% Grape. All that is available is a drink that is 15% Grape and another that is 31% Grape. Write and solve a system of equations to find out how many quarts of each of these should you mix together to end up with 30 quarts of the "perfect" 23% mixture?

Put answers here:

Equations & work:

Qts of 15% Grape drink =

Qts of 31% Grape drink =

Algebra 1 Bellwork Tuesday, February 23, 2016 **Answers**

1. A plane flies round-trip between two cities that are 1200 miles apart. One of the directions takes 4.8 hours because the plane is flying with a tailwind. The other direction takes 6 hours because the plane if flying against a headwind. Write and solve a system of equations to find the speed of the plane and the speed of the wind.

$d = rt$

p = speed of the plane
w = speed of the wind

Equations & work:

Headwind EQ: $1200 = (p-w)6 \longrightarrow 200 = p-w$

Tailwind EQ: $1200 = (p+w)4.8 \longrightarrow 250 = p+w$

$$\frac{450}{2} = \frac{2p}{2}$$

$p = 225$

$250 = 225 + w$

$25 = w$

Put answers here:

Plane speed = 225 mph

Wind speed = 25 mph

2. You use your boat on a nearby river to make two trips. You travel downstream 13.5 miles in 1.8 hours. You turn around and travel upstream 7.26 miles in 2.2 hours. Write and solve a system of equations to find the speed of the boat and the speed of the current in the river.

$d = rt$

b = boat's speed
c = current speed

Equations & work:

upstream EQ: $7.26 = (b-c)2.2$

downstream EQ: $13.5 = (b+c)1.8$

$3.3 = b-c$

$+\ 7.5 = b+c$

$10.8 = 2b$

$b = 5.4$

$7.5 = 5.4 + c$

$2.1 = c$

Put answers here:

Boat speed = 5.4 mph

Current speed = 2.1 mph

3. After experimenting you've found that the "perfect" mixture for a drink is 23% Grape. All that is available is a drink that is 15% Grape and another that is 31% Grape. Write and solve a system of equations to find out how many quarts of each of these should you mix together to end up with 30 quarts of the "perfect" 23% mixture?

x = qts of 15%
y = qts of 31%

Equations & work:

TOTAL DRINK EQ: $x + y = 30 \longrightarrow y = 30 - x$

"Grape" EQ: $.15x + .31y = .23(30) = 6.9$

$.15x + .31(30-x) = 6.9$

$.15x + 9.3 - .31x = 6.9$

$-.16x + 9.3 = 6.9$

$-9.3 \quad -9.3$

$\frac{-.16x}{-.16} = \frac{-2.4}{-.16}$

$x = 15$

$x + y = 30$

$15 + y = 30$

$y = 15$

Put answers here:

Qts of 15% Grape drink = 15 QTS

Qts of 31% Grape drink = 15 QTS