Lana can complete the inventory in 8 hours. Max can complete the inventory in 10 hours. How long would it take them to complete the inventory if they worked together?

$Q = r \cdot t$

Q = Quantity completed
r = rate job is done
t = time worked

Lana: 1 inventory in 8 hrs $\rightarrow r = \frac{1 \text{ inv}}{8 \text{ hrs}} = \frac{1}{8}$ inv/hr

Max: 1 inv in 10 hrs $\rightarrow r = \frac{1 \text{ inv}}{10 \text{ hrs}} = \frac{1}{10}$ inv/hr

$Q = r \cdot t$ Q = 1 inventory t = # hrs working together

Together $1 = \frac{1}{8}t + \frac{1}{10}t$

$40(1) = \left(\frac{t}{8} + \frac{t}{10}\right)40$

$40 = 5t + 4t$

$40 = 9t$

$t = \frac{40}{9}$ hrs

Suppose one painter can paint a house in 12 hrs, and a second painter takes 15 hrs to paint the same house. How long will it take the two painters to paint the house if they work together?

1st painter: 1 house in 12 hrs $= \frac{1 \text{ house}}{12 \text{ hrs}} \rightarrow r = \frac{1}{12}$ house/hr

2nd painter: 1 house in 15 hrs $= \frac{1 \text{ house}}{15 \text{ hrs}} \rightarrow r = \frac{1}{15}$ house/hr

Q = 1 house
t = # hrs working together

together $Q = r \cdot t$

$60(1) = \left(\frac{1}{12}t + \frac{1}{15}t\right)60$

$60 = 5t + 4t$

$60 = 9t$

$t = \frac{60}{9} = \frac{20}{3}$ hrs

One pump can fill a tank is 1 hour and 10 minutes. Another pump can fill the same tank in 1 hour and 30 minutes. How long would it take them to fill the tank together?

1st pump: 1 tank in 70 minutes

$r = \frac{1 \text{ tank}}{70 \text{ min}} = \frac{1}{70}$ tank/min

2nd pump: 1 tank in 90 minutes

$r = \frac{1 \text{ tank}}{90 \text{ min}} = \frac{1}{90}$ tank/min

working together:

$Q = rt$

$Q = 1$ tank

t = # min pumps work together

$1 = \frac{1}{70}t + \frac{1}{90}t$

$630(1) = \left(\frac{t}{70} + \frac{t}{90}\right)630$

$630 = 9t + 7t$

$630 = 16t$

$t = \frac{630}{16}$

$t = \frac{315}{8}$ min

An inlet pipe can fill a barrel in 8 hrs and an outlet pipe can empty it in 12 hrs. How long will it take to fill the barrel if both pipes are left open?

inlet pipe: fill 1 barrel in 8 hrs $\rightarrow \frac{1 \text{ barrel}}{8 \text{ hrs}}$

$r = \frac{1}{8}$ barrels/hr

outlet pipe: empty 1 barrel in 12 hrs $\rightarrow \frac{1 \text{ barrel}}{12 \text{ hrs}}$

$r = 1/12$ barrels/hr

working together:

$Q = r \cdot t$

$Q = 1$ barrel t = #hrs together

$24(1) = \left(\frac{1}{8}t - \frac{1}{12}t\right)24$

$24 = 3t - 2t$

$24 \text{ hrs} = t$

One printing press can produce a newspaper in 6 hrs when running alone. A secon press could produce the paper in 9 hrs if running alone. A third press could do the job in 12 hrs if running alone. To get the job done as quickly as possible all three presses are running at the same time. How long will it take to produce the paper?

1ST press : $r = \frac{1}{6}$ paper/hr

2nd press : $r = \frac{1}{9}$ paper/hr

3rd press : $r = \frac{1}{12}$ paper/hr

working together:

$Q = r \cdot t$

$Q = 1$ news paper

$t =$ # hrs working together

$36(1) = \left(\frac{1}{6}t + \frac{1}{9}t + \frac{1}{12}t\right)36$

$36 = 6t + 4t + 3t$

$36 = 13t$

$t = \frac{36}{13}$ hrs

You can now finish Hwk #11

Sec 9-6

Due tomorrow

Pages 524

Problems 5, 22, 25, 41, 46, 48, 51

You are now ready for the Chapter 9 Test