11/26/12 Today

- Review Speed Problems (#6)
- Discuss Velocity Problems
- Complete Velocity 1 Worksheet
- Shop Work Time

Speed Problem #6: Manfred the wooly mammoth is sprinting to Portland. For the first 70 miles, he sprints at 15 miles per hour. For the last 15 miles, he sprints at 20 miles per hour. What was his average speed?

d d r r mi/hr

(1a) $d_1 = 70$ mi; $d_2 = 15$ mi; $d_T = 85$ mi

$r_1 = 15$ mi/hr; $r_2 = 20$ mi/hr

(1b) $r_T = ?$

(2) $r_T = \frac{d_T}{t_T}$ $\quad t_T = t_1 + t_2$

t_1

(1a) $d = 70$ mi $\quad r = 15$ mi/hr

(1b) $t_1 = ?$

(2) $r = \frac{d}{t_1}$

(3) $15 = \frac{70}{t_1}$

(4) $15(t_1) = \frac{70}{t_1}(t_1)$

$\frac{15t_1}{15} = \frac{70}{15}$

$t_1 = \frac{70}{15} = 4.67$ hr

t_2

(1a) $d = 15$ mi $\quad r = 20$ mi/hr

(1b) $t_2 = ?$

(2) $r = \frac{d}{t}$

(3) $20 = \frac{15}{t_2}$

(4) $20(t_2) = \frac{15}{t_2}(t_2)$

$\frac{20t_2}{20} = \frac{15}{20}$

$t_2 = \frac{15}{20} = .75$ h

(1a) $d = 70 + 15 = 85$ mi

$t = 4.67 + .75 = 5.42$ hr

(1b) $r = ?$

(2) $r = \frac{d}{t}$

(3) $r = \frac{85}{5.42}$

(4) $r = \frac{85}{5.42} = \boxed{15.69 \text{ mi/hr}}$

(5) $(5.42)15.69 = \frac{d}{5.42}(5.42)$

$5.42(15.69) = d$

$d = 85.04$ mi ✓

Speed Problem #6: Manfred the wooly mammoth is sprinting to Portland. For the first 70 miles, he sprints at 15 miles per hour. For the last 15 miles, he sprints at 20 miles per hour. What was his average speed?

(1a) $d = 70+15 = 85$ mi
$t = ? = t_1 + t_2$

(1b) $v = ?$

NEED TO FIND t

t_1

(1a) $d = 70$ mi
$v = 15$ mi/hr

(1b) $t_1 = ?$

(2) $v = d/t$

(3) $15 = 70/t_1$

(4) $t_1 = 70/15 = 4.67$ hr

t_2

(1a) $d = 15$ mi
$v = 20$ mi

(1b) $t_2 = ?$

(2) $v = d/t$

(3) $20 = 15/t_2$

(4) $t_1 = 15/20 = .751$

(1a) $d = 70 + 15 = 85$ mi
$t = 4.67 + .75 = 5.42$ hr

(1b) $v = ?$

(2) $v = d/t$

(3) $v = 85/5.42$

(4) $v = 85/5.42 =$ **15.68 mi/hr**

(5) $15.68 = d/5.42$

$(5.42)(15.68) = d$

Velocity Problems: How Are They Different Than Speed Problems?

- We Want To Use Displacement Instead of Distance (d)

- Direction Is Important

- All v's Must Have A Direction

15.69 mi/hr NORTH

Toward Portland

Down The Highway