

# Section 6.7: cont'd

Tuesday, November 19, 2013  
8:42 AM

Assignment # 5 due on

Tuesday, Nov 26

Quiz # 5 on Friday, Nov 29

- on chapter 6

David and Keith are race-drivers for a fast-photo company. David's route is 80 miles and Keith's route is 100 miles. Keith averages 10 mph more than David and finishes his route 10 minutes before David. What is David's speed?

	d	=	r	·	t
David	80		r		$\frac{80}{r}$
Keith	100		$r+10$		$\frac{100}{r+10}$

$\frac{1}{6}$  hour

$$t_{\text{David}} = t_{\text{Keith}} + \frac{1}{6}$$

$$6r(r+10)\left(\frac{80}{r}\right) = \left(\frac{100}{r+10} + \frac{1}{6}\right)6r(r+10)$$

$$480(r+10) = 600r + r(r+10)$$

$$480r + 4800 = 600r + r^2 + 10r$$

$$0 = r^2 + 130r - 4800$$

$$0 = (r - 30)(r + 160)$$

$$r = 30, -160$$

$$ac = -48$$

$$1 \quad 48$$

$$2 \quad 24$$

$$-30 \quad 160$$

$$4 \quad 12$$

$$6 \quad 8$$

David's speed is 30 mph.

work problems:

$$\text{work} = \text{rate} \cdot \text{time}$$

Lorraine can trim the hedges around her property in 4 hours using an electric hedge trimmer. Ralph can do the same job in 12 hours using an environmentally-friendly hand trimmer. How long will it take them working together?

	work	=	rate	·	time
Lorraine	1 hedge		$\frac{1}{4}$		4
Ralph	1 hedge		$\frac{1}{12}$		12
together	1 hedge		$\frac{1}{6}$		t

$$12t \left( \frac{1}{4} + \frac{1}{12} \right) = \left( \frac{1}{t} \right) 12t$$

$$3t + t = 12$$

$$4t = 12$$

$$t = 3$$

They take 3 hours working together.

Sean can clean the living room in a certain amount of time. It takes his toddler half an hour less than that to completely destroy the room. If the two of them start together in a perfectly neat living room, it takes a total of 6 hours for the room to become a complete shambles. How long does it take Sean to clean the room by himself?

	work	=	rate	.	time
Sean	1		$\frac{1}{t+1/2}$		$t+1/2$
kid	-1		$-\frac{1}{t}$		$t$
together	-1		$-\frac{1}{6}$		$6$

task: clean one room

$$6t(t+1/2) \left( \frac{1}{t+1/2} - \frac{1}{t} \right) = \left( -\frac{1}{6} \right) 6t(t+1/2)$$

$$6t - 6(t+1/2) = -t(t+1/2)$$

$$\cancel{6t} - \cancel{6t} - 3 = -t^2 - \frac{1}{2}t$$

$$2(t^2 + \frac{1}{2}t - 3) = 0 \cdot 2$$

$$2t^2 + t - 6 = 0$$

$$2t^2 + 4t - 3t - 6 = 0$$

$$2t(t+2) - 3(t+2) = 0$$

$$(2t-3)(t+2) = 0$$

$$t = \cancel{-2}, \frac{3}{2}$$

$$\text{Sean's time} = \frac{3}{2} + \frac{1}{2} = 2$$

Sean, when working alone, takes 2 hours to clean the living room.

Adventures, Inc. has a \$1500 group rate for an overnight kayak trip. For the last trip, five people failed to show, causing the price per person to increase by \$25. How many were originally scheduled for the trip?

	price	= price/person	number of people
original	1500	$\frac{1500}{x}$	x
no shows	1500	$\frac{1500}{x-5}$	x-5

no shaws

1500

$$\frac{1500}{x-5}$$

x-5

original price/person + 25 = new price/person

$$x(x-5) \left( \frac{1500}{x} + 25 \right) = \left( \frac{1500}{x-5} \right) x(x-5)$$

$$\frac{1}{5} (1500(x-5) + 25x(x-5)) = (1500x) \frac{1}{5}$$

$$\frac{1}{5} (300(x-5) + 5x(x-5)) = (300x) \frac{1}{5}$$

$$60(x-5) + x(x-5) = 60x$$

$$60x - 300 + x^2 - 5x = 60x$$

$$x^2 - 5x - 300 = 0$$

$$(x-20)(x+15) = 0$$

$$x = 20, \cancel{-15}$$

ac = -300

1 300

2 150

3 100

4 75

5 60

6 50

10 30

12 25

+15 -20

Twenty people originally signed up for the trip.