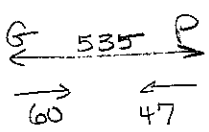
(*) { PAGE 1 ⇒ 2.7
PAGE 2 ⇒ ~~4.4~~ 4.4 } (2.7)

Key

MATH 45 – PRACTICE PROBLEMS MOTION AND MIXTURE

1. Granville and Preston are 535 miles apart. A car leaves Preston bound for Granville at 47 mph. At the same time, another car leaves for Granville bound for Preston at 60 mph. How long will it take them to meet?



	D = R · T		
→	60T	60	T
←	47T	47	T
	535		

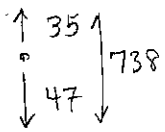
opposite direction ⇒ add

$60T + 47T = 535$

$107T = 535$

$T = 5$ hrs

2. Two boats leave port at the same time, one heading north at 35 knots (nautical miles per hour) and the other south at 47 knots. How long will it take them to be 738 nautical miles apart?



	D = R T		
	35T	35	T
	47T	47	T
	738		

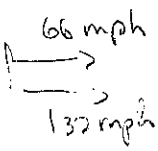
opposite direction add

$35T + 47T = 738$

$82T = 738$

$T = 9$ hrs

3. Two crooks rob a bank and flee to the east at 66 mph. In 30 minutes, the police follow them in a helicopter, flying at 132 mph. How long will it take for the police to overtake the robbers?



D =	R	T
66T	66	T
132(T-½)	132	T-½
set =		

Same diff times ⇒ set distances equal

$66T = 132(T - .5)$

$66T = 132T - 66$

$66 = 66T$

$1 \text{ hr} = T$ = robbers

$T - ½ =$ ½ hr police

4. Paint costing \$19 per gallon is to be mixed with 5 gallons of paint thinner costing \$3 per gallon to make a paint that can be sold for \$14 per gallon. How much paint will be produced?

Paint	+	Thinner	=	thinned paint
x gal		5 gal		x+5 gal
\$19/gal		\$3/gal		\$14/gal

add \$ →

$19x + 15 = 14(x+5)$

$19x + 15 = 14x + 70$

$5x = 55$

$x = 11$ gals paint

$11 + 5 =$ **16 gal thinned paint**

5. A photographer wishes to mix 2 liters of a 5% acetic acid solution with a 10% solution to get a 7% solution. How many liters of 10% solution must be added?

2 L	+	x L	=	x+2 L
5%		10%		7%

$(.05)2 + .1x = .07(x+2)$ ← add pure acid

$.1 + .1x = .07x + .14$

$.03x = .04$

$x =$ **1⅓ L 10%**

6. Twenty pounds of lemon drops are to be mixed with cherry chews to make a mixture that will sell for \$1.80 per pound. Lemon drops cost \$1.70 per pound, and cherry chews are \$2.00 per pound. How much of the more expensive candy should be used?

Lemon drops	+	Cherry chews	=	Mix
20 lb		x lb		x+20
\$1.70/lb		\$2/lb		\$1.80/lb

add \$ →

$20(1.70) + 2x = 1.8(x+20)$

$34 + 2x = 1.8x + 36$

$.2x = 2$

$x =$ **10 lbs cherry chews**