Algebra 2 HW Key 2/3/12

(1)

object	rate (mph)	time (hrs)	distance (miles)
city	35	x	$35x$
highway	60	$3-x$	$60(3-x)$
total		3 hrs	150 miles

$35x + 60(3-x) = 150$
$35x + 180 - 60x = 150$
$-25x = -30$
$x = 1.2$

1.2 hours in the city

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(3) First part of race: 30 km
Remaining part: 70 km ← 100 − 30

12 minutes $= \frac{12}{60}$ hr $= 0.2$ hr

object	rate	time (hrs)	distance
A	25	x	$25x$
B	27.5	$x-.2$	$27.5(x-.2)$

If A finishes ... $25x = 70$
$x = 2.8$ hours

At that point, B would have gone
$27.5(2.8-.2) = 27.5(2.6) = 71.5$ km

So B finished first.

B catches A → $25x = 27.5(x-.2)$
$25x = 27.5x - 5.5$
$5.5 = 2.5x$
$2.2 = x$

B catches A 2.2 hours after B's mishap.

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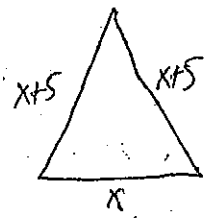
(6)

object	rate	time	distance
upstream	6	x	$6x$
downstream	12	$4-x$	$12(4-x)$

$6x = 12(4-x)$
$6x = 48 - 12x$
$18x = 48$
$x = \frac{48}{18} = \frac{8}{3}$

How far: $6x$ → $6(\frac{8}{3}) =$ 16 miles between docks

(9)

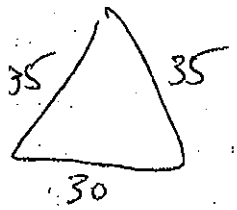


$x + (x+5) + (x+5) = 100$

$3x + 10 = 100$

$3x = 90$

$x = 30$



30, 35, 35 cm cm cm

(12)

$A: 2x$

$B: x$

$C: 2x-12$

$10A + 5B + 3C = 522$

$10(2x) + 5(x) + 3(2x-12) = 522$

$20x + 5x + 6x - 36 = 522$

$31x = 558$

$x = 18$

$A: 2(18) = 36$

$B: 18$

$C: 2(18) - 12 = 24$

A: 36 jars
B: 18 jars
C: 24 jars

(13)

object	rate	time	work
A	$\frac{1}{6}$	x	$\frac{x}{6}$
B	$\frac{1}{8}$	x	$\frac{x}{8}$
	$\frac{\#\text{jobs}}{\text{time}}$	time	#jobs

$48\left(\frac{x}{6} + \frac{x}{8}\right) = (1)\,48$

$8x + 6x = 48$

$14x = 48$

$x = 3.42857$ hours

(14)

object	rate	time	work
April	$\frac{1}{6}$	x	$\frac{1}{6}x$
Whitney	$\frac{1}{4}$	x	$\frac{1}{4}x$
Annabeth	$\frac{1}{3}$	x	$\frac{1}{3}x$
	$\frac{\#\text{jobs}}{\text{time}}$	time	#jobs

$\frac{\#\text{jobs}}{\text{time}} \cdot \text{time} = \#\text{jobs}$

↑ working together (same)

$12\left(\frac{1}{6}x + \frac{1}{4}x + \frac{1}{3}x\right) = (1)\,12$

$2x + 3x + 4x = 12$

$9x = 12$

$x = \frac{12}{9}$

$x = 1.333$ hours