Ben's bearded travels $\frac{300\ mi/hr}{mi/hr}$
moonshine tilling Nana

20 year old melted
pack of Werther's original traveling $\frac{400\ mi/hr}{mi/hr}$
hard candies.

Leaves ___8___ hours later in the same

direction. How long until boom?

Head start: 8 hrs * 300 mi/hr = 2400 miles
   distance

Relative Rate: 400 - 300 = 100 mi/hr

time to
   intercept : $\frac{Head\ start\ distance}{relative\ rate}$ = $\frac{2400\ mi}{100\ mi/hr}$ = $\boxed{24\ hrs}$

270 pounds of raw
cookie dough
―――――――――――   travels $\dfrac{500\ mi/hr}{mi/hr}$
obj #1

100 packets of Just for
Men all natural hair
dye for beards (for   travelling $\dfrac{750\ mi/hr}{mi/hr}$
―――――――――――
obj #2   Ben's Nana)

Leaves ___6___ hours later in the same

direction. How long until boom boom?

Head start
distance   6 hrs * 500 mi/hr = 3000 miles

Relative Rate   750 mi/hr - 500 mi/hr = 250 mi/hr

$\dfrac{3000\ mi}{250\ mi/hr}$ = $\boxed{12\ hours}$

Algebra 1
Chapter 2 Practice Test

1.) (5 pts each) Solving One Step Equations (2-1) Solve each equation.

a) $b + 8 = 21$

$-8 \quad -8$

$b = 13$

b) $a - 11 = 54$

c) $6a = 72$

$\dfrac{6a}{6} \quad \dfrac{72}{6}$

$a = 12$

d) $\left(\dfrac{y}{8}\right) = \left(5\right)$

$y = 40$

e) $-15t = 45$

2.) (5 pts each) Solving Two-Step Equations (2-2) Solve each equation.

a) $3x + 8 = 44$

$$ \frac{-8 \quad -8}{}$$

$$\frac{3x}{3} = \frac{36}{3} \qquad \boxed{X = 12}$$

b) $\frac{b}{5} - 4 = -2$

$$\frac{+4 \quad +4}{}$$

$$5\left(\frac{b}{5}\right) = (2)5 \qquad \boxed{b = 10}$$

c) $15 = 6x - 9$

d) $8 = \frac{a}{-7} + 12$

3.) (5 pts each) Solving Multi-Step Equations (2-3) Solve each equation.

a) $8c + 7(2c - 3) = 23$

b) $3(4 + x) - (2x + 3) = 14$

$\boxed{12} + 3x - 2x \boxed{-3} = 14$

$x + 9$

$x + 9 = 14$
$-9 \quad -9$

$\boxed{x = 5}$

c) $9y - 2(3y - 5) = 8$

$9y - 6y + 10 = 8$

$3y + 10 = 8$
$\quad -10 \quad -10$

$3y = -2$
$\overline{3} \quad \overline{3}$

$\boxed{y = \frac{-2}{3}}$

d) $\left(\frac{c+5}{2}\right)^2 = (11)^2$

$c + 5 = 22$

4.) (5 pts each) Equations with Variables on Both Sides (2-4) Solve each equation.

a) $6x - 25 = 7 - 2x$

b) $4(a - 2) = 7a - 35$

$-3 * a$

$4a - 8 = 7a - 35$
$-7a \qquad -7a$

$-3a - 8 = -35$
$\quad + 8 \quad + 8$

$-3a = -27$
$\overline{-3} \quad \overline{-3}$

$\boxed{a = 9}$

c) $9b + 15 = 11b + 27$

d) 8(3y - 2) = 4(5y + 4)

5.) (5 pts each) Equations and Problem Solving (2-5) Write and solve an equation for each situation.

a) A man stole Nate's burrito and drove away at 50 mi/hr. Hangry, Nate took off on foot in the same direction a half an hour later. If Nate ran at 60 mi/hr, how long will it take for him to catch the nefarious burrito burglar?

Head start distance $50 \frac{mi}{hr} * 0.5 hr = 25 mi$

Relative Rate = $60 - 50 = 10 \frac{mi}{hr}$

time intercept = $\frac{25}{10}$ = $\boxed{2.5 \text{ hours}}$

b) A train leaves the station at 12pm traveling at 120 mi/hr. A second train left from the same station at 2pm traveling 80 mi/hr in the opposite direction. How long until the trains are 840 miles apart?

c) Usain Bolt ran an iron man event at a respectable 12 mi/hr. Nate, feeling generous, gave him an hour head start. If Nate ran 18 mi/hr, how long until he caught up with Usain Bolt?