Algebra I

pg 28

1)	water color: 8 yrs painting: 24 yrs	6)	trapeze: 120 lbs clown: 180 lbs	11)	School: 18m
2)	auditorium: 28 yrs gym: 7 years	7)	44 Republicans 56 Democrats	12)	Leah: 4.5 km Barb: 6 km
3)	smaller: 64 larger: 121	8)	207 boys 224 girls	13)	width: 11m length: 23m
4)	smaller: 29 larger: 116	9)	Ramon: $ 90 Elena: $ 135	14)	width: 12 cm length: 42 cm
5)	car: 159 km bus: 477 km	10)	Southern: 12 yrs Western: 30 yrs	15)	Skip

2) The gym is 21 years newer than the auditorium. The gym is also one fourth as old as the auditorium. How old is each building?

Let x = age of auditorium — 28 yrs

$x-21$ = age of gym — 7 yrs

$$\left(x-21 = \frac{1}{4}x\right)4$$

$$4x - 84 = x$$

$$4x - 4x - 84 = x - 4x$$

$$\frac{-84}{-3} = \frac{-3x}{-3}$$

$$28 = x$$

$$\{28\}$$

4) One number is four times another number. The larger number is also 87 more than the smaller number. Find the numbers.

Let x = 1st num

$4x$ = 2nd num

$4x = x + 87$

$4x - x = x - x + 87$

$3x = 87$

5) A bus went 318 km farther than a car. The car went one third as far as the bus. How far did each vehicle travel?

Let x = car's distance

$x + 318$ = bus' distance

$x = \frac{1}{3}(x + 318)$ 3

$3x = 1(x + 318)$

6) A clown weighs 60 lbs more than a trapeze artist. The trapeze artist weighs two thirds as much as the clown. How much does each weigh?

x+60 x x

Let x = trapeze artist's weight
x+60 = clown's weight

$3\left[x = \frac{2}{3}(x+60)\right]$

$3x = 2(x+60)$
$3x = 2x + 120$

7) The U.S. Senate has 100 members, all Democrats or Republicans. Recently there were 12 more Democrats than Republicans. How many Senators from each political party were there at that time?

let x = republicans 94
x+12 = democrats 56
x+x+12=100
2x+12=100
2x+12-12=100-12
$\frac{2x}{2} = \frac{88}{2}$ x = {44}

8) The ninth grade class has 17 more girls than boys. There are 431 students in all. How many boys and girls are there?

let x = boys
x + 17 = girls
x + x + 17 = 431
2x + 17 = 431
2x + 17 − 17 = 431 − 17
$\frac{2x}{2} = \frac{414}{2}$
x = 207

207
224

207
17
224

9) Elena has one and a half times as much money as Ramon. Together they have $255. How much money does each have?

Let x = Ramon $90
1.5x = Elena $135
x + 1.5x = 225
$\frac{2.5x}{2.5} = \frac{225}{2.5}$
x = $90

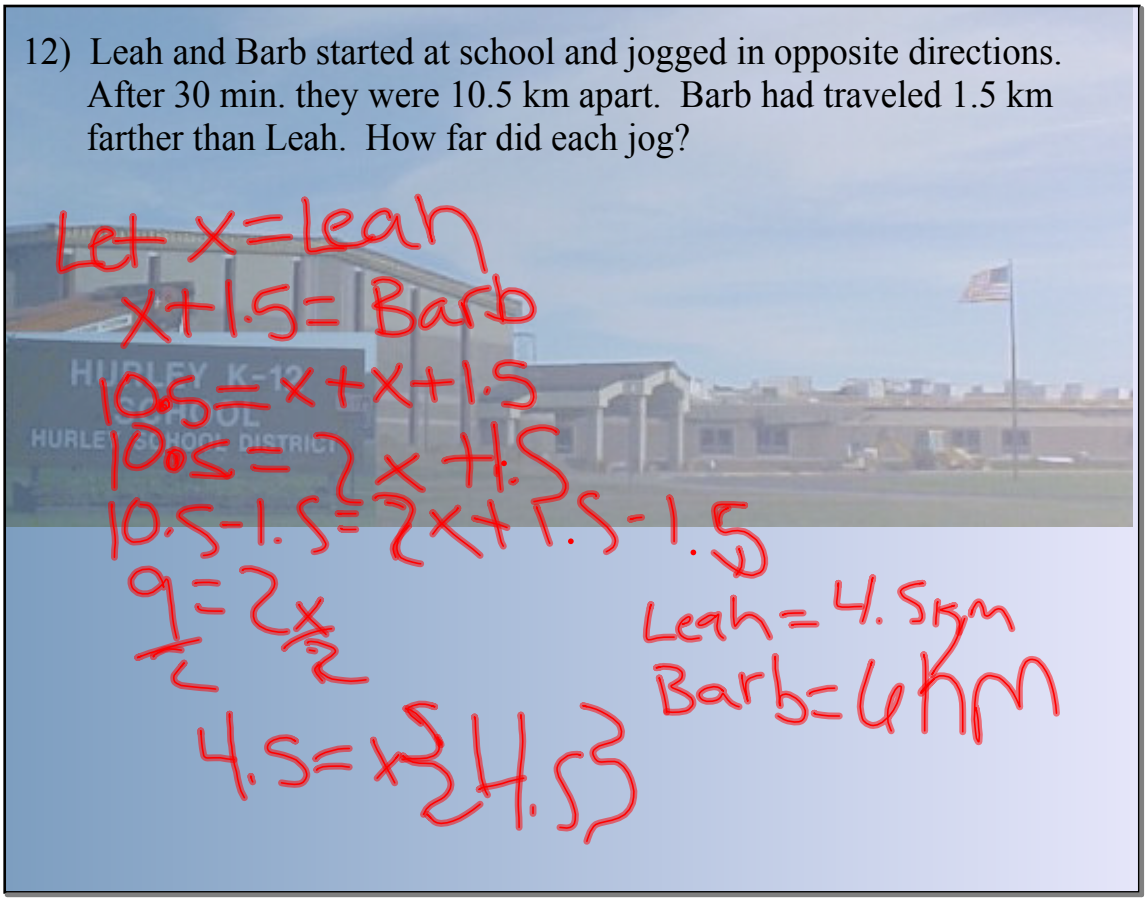
10) Western State College is 18 years older than Southern State. Western is also $2\frac{1}{2}$ times as old as Southern. How old is each?

Let x = age of Southern State
$x+18$ = age of Western State

12 yrs
30 yrs

$x+18 = 2.5x$
$x - x + 18 = 2.5x - x$
$\frac{18}{1.5} = \frac{1.5x}{1.5}$
$12 = x$

12) Leah and Barb started at school and jogged in opposite directions. After 30 min. they were 10.5 km apart. Barb had traveled 1.5 km farther than Leah. How far did each jog?



Let x = Leah
$x+1.5$ = Barb
$10.5 = x + x + 1.5$
$10.5 = 2x + 1.5$
$10.5 - 1.5 = 2x + 1.5 - 1.5$
$9 = 2x$
$\frac{9}{2} = \frac{2x}{2}$
$4.5 = x$ or 1.5

Leah = 4.5 km
Barb = 6 km

13) A rectangle is 12 m longer than it is wide. Its perimeter is 68 m. Find its length and width.

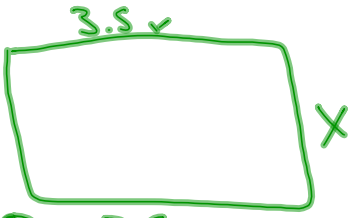
14) The length of a rectangle is $3\frac{1}{2}$ times its width. Its perimeter is 108 cm. Find its length and width.

Let x = width

$3.5x$ = length

12cm

42cm



$x + x + 3.5x + 3.5x = 108$

$2x + 7x = 108$

$\frac{9x}{9} = \frac{108}{9}$

$x = 12$ cm (12cm)