MASSACHUSETTS MATHEMATICS LEAGUE
OCTOBER 2003
ROUND 3: LINEAR EQUATIONS

ANSWERS

A) $-5/2$

B) 40

C) 39

A) Solve for x, leaving the result as a reduced fraction

$$4(x-3)-3(x-7)-\frac{6}{5}(5x+10)=\frac{2}{3}(x-5)-\frac{1}{3}(x-4)$$

$$4x-12+3x+21-6x-12=\frac{2}{3}x-\frac{10}{3}-\frac{1}{3}x-\frac{4}{3}$$

$$x-3=\frac{1}{3}x-\frac{14}{3}$$

$$\frac{2}{3}x=3-\frac{14}{3}=-\frac{5}{3}$$

$$x=-\frac{5}{2}$$

B) The coins from Jeremy's tips total $3.16. He has two more dimes than quarters, one less than twice as many nickels as dimes, and three more pennies than dimes. How many coins does he have?

D = # dimes

$Q=D-2$

$N=2D-1$

$P=D+3$

$25(D-2)+10D+5(2D-1)+(D+3)=316$

$25D-50+10D+10D-5+D+3=316$

$46D-52=316$

$46D=368$

$D=8$

$Q=6$

$N=15$

$P=11$

ANS 40

C) Karin's exercise route is 4 miles long. She alternates running one-quarter mile at ten mph, and then walking one-half mile at five mph. How many minutes does it take her to complete her route?

R W R W R W W R W R W R

$\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{4}$

$\frac{1}{4}\cdot 6=\frac{3}{2}$ mi running

$\frac{1}{2}\cdot 5=\frac{5}{2}$ mi walking

$\frac{3}{2}\cdot\frac{1}{10}\cdot 60+\frac{5}{2}\cdot\frac{1}{5}\cdot 60=$ Time in min

$9+30=39$