Test 2 Solutions

1) Solve the following equations

(a) *(4 points)* $2x-7=-9$

$2x=-9+7$

$2x=-2$

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

$x=-1$

(b) *(4 points)* $\frac{1}{2}x+2=-\frac{1}{4}x$

$4\left(\frac{1}{2}x+2\right)=4\left(-\frac{1}{4}x\right)$

$4\cdot\frac{1}{2}x+4\cdot 2=-4\cdot\frac{1}{4}x$

$2x+8=-x$

$2x+8-8=-x-8$

$2x=-x-8$

$2x+x=-8$

$3x=-8$

$x=-\frac{8}{3}$

(c) *(4 points)* $4(k-6)-(3k+2)=-5$

$4k-(4)(6)-3k-2=-5$

$4k-24-3k-2=-5$

$k-26=-5$

$k-26+26=-5+26$

$k=21$

(d) *(4 points)* $\frac{m}{5}=\frac{m-2}{2}$

$2m=5(m-2)$

$2m=5m-(5)(2)$

$2m=5m-10$

$2m-5m=5m-10-5m$

$-3m=-10$

$\frac{-3m}{-3}=\frac{-10}{-3}$

$m=\frac{10}{3}$

2) *(4 points)* If twice a number is divided by 5, the result is 4. Find the number.

Let number be x, then $\frac{2x}{5}=4$

$\frac{2x}{5}=4$

$5\cdot\frac{2x}{5}=5\cdot 4$

$2x=20$

$x=10$

3) *(4 points)* In 204 Olympic Games the US won 40 more medals than China. The two countries won a total of 110 medals. How many medals did each country win?

Let China won x medals, then US won 40+x medals, the total is 110, so we get
x+(40+x)=110
2x+40=110
2x+40 - 40=110 – 40
2x = 70
$\frac{2x}{2} = \frac{70}{2}$
x=35 Thus China won 35 medals and the US 40+35 =75 medals.

4) *(4 points)* In one day, a store sold $\frac{1}{5}$ as many DVDs as CDs. The total number of DVDs and CDs sold that day was 60. How many DVDs were sold?

Let they sold x CDs then the number of DVDs sold is $\frac{1}{5}$ of x, i.e. $\frac{1}{5}$x.
Since the total number is 60, we get
$\frac{1}{5}$x+x=60
5($\frac{1}{5}$x+x)=(5)(60)
5. $\frac{1}{5}$x+5x=300
x+5x=300
6x=300
x=300/6
x=50, Thus the number of CDs sold is 50 and the number of DVDs is $\frac{1}{5}$x=$\frac{1}{5}$(50)=10.

5) *(4 points)* Find two consecutive even integers such that the lesser added to three times the greater gives sum of 46.
Let x represent the lesser even integer and (x+2) the greater even integer. Then we have:
x added to three times (x+2) gives sum 46, which gives us
x+3(x+2)=46
x+3x+(3)(2)=46
4x+6=46
4x+6 - 6=46 – 6
4x=40
x=40/4
x=10
x=10, thus the lesser integer is 10 and the greater 3(x+2)=3(10+2)=(3)(12)=36.

6) *(4 points)* Eight quarts of oil cost $14.00. How much do 5 qt of oil cost?

Let 5 qt is $x
8 qt correspond to $14, 5 qt correspond to $x, we get
$\frac{8}{14} = \frac{5}{x}$

8x=(5)(14)
8x=70
x=70/8
x=35/4=$8.75

7) *(4 points)* A chemist needs to mix 20 L of a 40% acid solution with some 70% acid solution to obtain a mixture that is 50% acid. How many liters of the 70% acid solution should be used? You may use the following table

Liters of solution	Rate(as decimal)	Liters of pure acid
20	0.4	0.4(20)
x	0.7	0.7x
20+x	0.5	0.5(20+x)

0.4(20)+0.7x=0.5(20+x) Multiply both sides by 10
(10)(0.4)(20)+(10)(0.7)x=(10)(0.5)(20+x)
4(20)+7x=5(20+x)
80+7x=(5)(20)+5x
80+7x=100+5x
80+7x – 5x=100+5x – 5x
80+2x=100
80+2x – 80=100 – 80
2x=20
x=20/2
x=10 liters

8) *(4 points)* A coin collector has $1.70 in dimes and nickels. She has two more dimes than nickels. How many nickels does she have? You may use the following table

	Number of coins	Denomination (value of one coin)	Total value
dimes	x+2	10	10(x+2)
nickels	x	5	5x
total			170

10(x+2)+5x=170
10x+(10)(2)+5x=170
10x+20+5x=170
15x+20 =170
15x+20 - 20=170 – 20
15x=150
x=150/15
x=10, so there are 10 nickels.