YOU MUST SHOW ALL OF YOUR WORK to receive full credit for the problem. The more work you show on your paper leading to your solution will give me more opportunity to award partial credit. **Clearly indicate your solution** to the problem.

1) Solve the following equations

(a) (4 point) $2x - 7 = -9$

$$2x - 7 = -9$$

$$2x = -9 + 7$$

$$2x = -2$$

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

$$x = -1$$

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

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

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

$$2x + 8 = -x$$

$$2x = -x - 8$$

$$2x + x = -8$$

$$3x = -8$$

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

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

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

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

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

$$k - 26 = -5$$

$$k = -5 + 26$$

$$k = 21$$

(d) (4 point) $0.2(60) + 0.05x = 0.1(60 + x)$

$$100[0.2(60)+0.05x]=100[0.1(60+x)]$$
$$(100)(0.2)(60)+(100)(0.05)x=(100)(0.1)(60+x)$$
$$(20)(60)+5x=10(60+x)$$
$$1200+5x=(10)(60)+10x$$
$$1200+5x=600+10x$$
$$1200+5x-600=10x$$
$$600+5x=10x$$
$$600=10x-5x$$
$$600=5x$$
$$\frac{600}{5}=x$$
$$x=120$$

2) If twice a number is divided by 5, the result is 4. Find the number.
Let the number be x, then
$$\frac{2x}{5}=4$$
$$2x=(4)(5)$$
$$2x=20$$
$$x=\frac{20}{2}$$
$$x=10$$

3) 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 the number of medals China won was x
Then the US won 40 more, i.e. 40+x
The two countries together won 110, so
40+40+x=110
80+x=110
x=110-80
x=30, thus China won **30** and the US 40+x=40+30=**70** medals

4) 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 the number of CDs sold be x,

Then the number of DVDs sold is $\frac{1}{5}$ x

The total number, i.e. the sum is x+$\frac{1}{5}$x=60

$(1+\frac{1}{5})$x=60

$$\frac{6}{5}x=60$$

$$\frac{5}{6}\cdot\frac{6}{5}x=\frac{5}{6}\cdot 60$$

$$x=(5)(10)$$

$$x=50$$

So **50** CDs sold and $\frac{1}{5}x=\frac{1}{5}(50)=\mathbf{10}$ (or 60-50=10) DVDs sold.

(a) $\dfrac{2(8^2-4)+8}{29-3^3}=\dfrac{2(64-4)+8}{29-27}=\dfrac{2(60)+8}{2}=\dfrac{120+8}{2}=\dfrac{128}{2}=114$

(b) $-\left|-\dfrac{2}{3}\right|+\dfrac{3}{|5|}=-\dfrac{2}{3}+\dfrac{3}{5}=-\dfrac{2\cdot 5}{3\cdot 5}+\dfrac{3\cdot 3}{5\cdot 3}=-\dfrac{10}{15}+\dfrac{9}{15}=\dfrac{-10+9}{15}=\dfrac{-1}{15}$

(c) $\dfrac{2}{3}-\left[\dfrac{1}{12}-\left(-\dfrac{1}{4}\right)\right]=\dfrac{2}{3}-\left[\dfrac{1}{12}+\dfrac{1}{4}\right]=\dfrac{2}{3}-\left[\dfrac{1}{12}+\dfrac{1\cdot 3}{4\cdot 3}\right]=\dfrac{2}{3}-\left[\dfrac{1}{12}+\dfrac{3}{12}\right]=$

$=\dfrac{2}{3}-\left[\dfrac{1+3}{12}\right]=\dfrac{2}{3}-\left[\dfrac{4}{12}\right]=\dfrac{2}{3}-\dfrac{4}{12}=\dfrac{2}{3}-\dfrac{1}{3}=\dfrac{2-1}{3}=\dfrac{1}{3}$

(d) $-\dfrac{1}{8}\div\left[-\dfrac{3}{4}\right]=-\dfrac{1}{8}\cdot\left(-\dfrac{4}{3}\right)=\dfrac{1}{8}\cdot\dfrac{4}{3}=\dfrac{1\cdot 4}{8\cdot 3}=\dfrac{1}{2\cdot 3}=\dfrac{1}{6}$

5) Find the value of the expression if x = 1, y = - 2

(a) $\dfrac{x^2-y^2}{x-y}=\dfrac{1^2-(-2)^2}{1-(-2)}=\dfrac{1-4}{1+2}=\dfrac{-3}{3}=-1$

(b) $\dfrac{x}{2}-\dfrac{y}{3}=\dfrac{1}{2}-\dfrac{(-2)}{3}=\dfrac{1}{2}-\left(-\dfrac{2}{3}\right)=\dfrac{1}{2}+\dfrac{2}{3}=\dfrac{1\cdot 3}{2\cdot 3}+\dfrac{2\cdot 2}{3\cdot 2}=\dfrac{3}{6}+\dfrac{4}{6}=\dfrac{3+4}{6}=\dfrac{7}{6}$

6) Write the phrase as an algebraic expression using x as the variable.

The product of 5 and four less than a number
Let number be x, then we want:
The product of 5 and four less than x OR
The product of 5 and (x-4), which is
5(x-4)

7) Write the word statement as an equation and find the solution.
   Three times a number is equal to 8 more than twice the number.

   Let number be x, then we want:
   Three times x is equal to 8 more than 2x, i.e.
   3x=2x+8
   3x-2x=8
   x=8

8) Simplify the expressions.
   (a) $-4(5-y)-6=-4(5)-4(-y)-6=-20+4y-6=-24+4y$

   (b) $-3(2t+4)+8(2t-4)$
       $-3(2t+4)+8(2t-4)=-3(2t)-3(4)+8(2t)+8(-4)=$
       $=-6t-12+16t-32=10t-44$

   (c) -4(-3k+3)-(6k-4)-2k+1=-4(-3k)-4(3)-6k+4-2k+1=12k-12-6k+4-2k+1=**4k-7**

   (d) $-\dfrac{4}{3}(y-12)-\dfrac{1}{6}y$
       $-\dfrac{4}{3}(y-12)-\dfrac{1}{6}y=-\dfrac{4}{3}y-\dfrac{4}{3}(-12)-\dfrac{1}{6}y=-\dfrac{4}{3}y+4(4)-\dfrac{1}{6}y=$
       $=-\dfrac{4}{3}y-\dfrac{1}{6}y+16=(-\dfrac{4}{3}-\dfrac{1}{6})y+16=(-\dfrac{4\cdot2}{3\cdot2}-\dfrac{1}{6})y+16=$
       $=(-\dfrac{8}{6}-\dfrac{1}{6})y+16=\dfrac{-8-1}{6}y+16=\dfrac{-9}{6}y+16=\dfrac{-3}{2}y+16$

9) State what properties of addition or multiplication are used (commutative, associative or distributive)
   (a) $-3(2+x)=-6-3x$ **Distributive**

   (b) $5\cdot\dfrac{2}{3}=\dfrac{2}{3}\cdot5$ **Commutative**

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(c) $(2+x)+a = 2+(x+a)$ **Associative**