Function notation.

1) Find the range of each function for the given domain

$h(x) = 3x + 3$ $\{-1.2, 0, 0.2, 1.2, 4\}$

$y =$

X	3x + 3	
-1.2	3(-1.2) + 3 -3.6 + 3	-0.6
0	3(0) + 3 0 + 3	3
0.2	3(0.2) + 3 0.6 + 3	3.6
1.2	3(1.2) + 3 3.6 + 3	6.6
4	3(4) + 3 12 + 3	15

Range $\{-0.6, 3, 3.6, 6.6, 15\}$

2) $f(x) = 8x - 3$; $\left\{-\frac{1}{2}, \frac{1}{8}, \frac{1}{4}, \frac{3}{4}\right\}$

x	$8x - 3$	y
$-\frac{1}{2}$	$8\left(-\frac{1}{2}\right) - 3$ $-4 - 3$	-7
$\frac{1}{8}$	$(8)\left(\frac{1}{8}\right) - 3$ $1 - 3$	-2
$\frac{1}{4}$	$8\left(\frac{1}{4}\right) - 3$ $\frac{8}{4} - 3 \quad 2 - 3$	-1
$\frac{3}{4}$	$8\left(\frac{3}{4}\right) - 3$ $\frac{24}{4} - 3$ $6 - 3$	3

Range $\{-7, -2, -1, 3\}$

5) $h(x) = 4x + 2$ $\{-1, 0, 2, 6, 7\}$

x	4x+2	y	(x, y)
-1	$4(-1)+2$ $-4+2$	-2	$(-1, -2)$
0	$4(0)+2$ $0+2$	2	$(0, 2)$
2	$4(2)+2$ $8+2$	10	$(2, 10)$
6	$4(6)+2$ $24+2$	26	$(6, 26)$
7	$4(7)+2$ $28+2$	30	$(7, 30)$

Range $\{-2, 2, 10, 26, 30\}$

6) $f(x) = x + 1$ $\{-\frac{1}{2}, \frac{1}{8}, \frac{1}{4}, \frac{3}{4}\}$

x	x+1	y	
$-\frac{1}{2}$	$-\frac{1}{2}+1$	$\frac{1}{2}$	
$\frac{1}{8}$	$\frac{1}{8}+1$	$1\frac{1}{8}$	$\frac{9}{8}$
$\frac{1}{4}$	$\frac{1}{4}+1$	$1\frac{1}{4}$ $\frac{5}{4}$	
$\frac{3}{4}$	$\frac{3}{4}+1$	$1\frac{3}{4}$ $\frac{7}{4}$	

3) $f(x) = x - 3$ $\{-3, -1, 1, 5, 7\}$

x	x-3	y
-3	-3 -3	-6
-1	-1 -3	-4
1	1 -3	-2
5	5 -3	2
7	7 -3	4

4.) $f(x) = -2x + 5$ $\{0, 2, 4, 6\}$

x	-2x+5	y
0	-2(0) + 5 0 + 5	5
2	-2(2) + 5 -4 + 5	1
4	-2(4) + 5 -8 + 5	-3
6	-2(6) + 5 -12 + 5	-7

Range $\{5, 1, -3, -7\}$

$\{-7, -3, 1, 5\}$

7.) The function $m(x) = 60x$ represents the number of miles, $m(x)$, you travel for x hours that you drive. How many miles will you drive in 5 hours?

$$m(x) = 60(5)$$
$$m(x) = \boxed{300 \text{ miles}}$$

8.) The function $h(x) = 2.5x + 20$ represents your height in iches, $h(x)$, for x years that you have been alive. How many inches tall will you be when you are 12 years old?

$$h(x) = 2.5x + 29$$
$$h(x) = 2.5(12) + 20$$
$$h(x) = 30 + 20$$
$$\boxed{h(x) = 50} \checkmark$$

9.) The domain of $f(x) = 4x+1$ $\{1, 2, 3, 4\}$

x	4x+1	y	(x, y)
1	4(1)+1 4+1	5	(1, 5)
2	4(2)+1 8+1	9	(2, 9)
3	4(3)+1 12+1	13	(3, 13)
4	4(4)+1 16+1	17	(4, 17)

Range $\{$ ~~go.~~
$\{$ 5, 9, 13, 17$\}$

10.) $f(x) = -5x$ $\{-5, 0, 10, 15\}$

x	-5x	y
-5	-5(-5)	25
0	-5(0)	0
10	-5(10)	-50
15	-5(15)	-75

$$f(x) = 2x \qquad g(x) = x^2 + 1$$

11) $f(3) + g(4)$

$$2x + x^2 + 1$$
$$2(3) + (4)^2 + 1$$
$$6 + 16 + 1$$
$$\boxed{23}$$

12) $f(g(3))$

$$f = 2x$$
$$f = 2(x^2 + 1)$$
$$f = 2(3)^2 + 1)$$
$$f = 2(9 + 1)$$
$$f = 2(10)$$
$$\boxed{f = 20}$$

13) $g(f(3))$

$$g(x) = x^2 + 1$$
$$g(x) = (2x)^2 + 1$$
$$g(x) = (2(3))^2 + 1$$
$$g(x) = (2(3))^2 + 1$$
$$g(x) = 6^2 + 1$$
$$g(x) = 36 + 1$$
$$\boxed{g(x) = 37}$$

14)
$$g(3) + f(4)$$
$$x^2 + 1 + 2x$$
$$(3)^2 + 1 + 2(4)$$
$$9 + 1 + 8$$
$$10 + 8$$
$$\boxed{18}$$

15.) $f(f(5))$

$f(x) = 2x$

$2(2x)$

$2(2(5))$

$2(10)$

$\boxed{20}$

16.) $f(2) + 3 \cdot g(4)$

$2x + 3(x^2 + 1)$

$2(2) + 3(4^2 + 1)$

$4 + 3(16 + 1)$

$4 + 3(17)$

$4 + 51$

$\boxed{55}$

17) $f(3) - 2 \cdot g(1)$

$\downarrow$

$2x - 2(x^2 + 1)$

$2(3) - 2[(1)^2 + 1]$

$6 - 2(2)$

$6 - 4$

$\boxed{2}$

18) $g(g(4))$

$x^2 + 1$

$(x^2 + 1)^2 + 1$

$((4)^2 + 1)^2 + 1$

$(16 + 1)^2 + 1$

$(17)^2 + 1$

$289 + 1$

$\boxed{290}$