4 ★ Answer OK w/o simplifying!

Classwork ~~3~~, MATH 1113 Harrison Chapman Name & Time: KEY

1. A function f is defined by $f(x) = -x^2 + x - 4$. Find the following values of $f(x)$. Your answers to this question will all be numbers.

a) $f(-3) = \boxed{-(-3)^2 + (-3) - 4} \star = -9 - 3 - 4 = -16$

b) $f(0) = \boxed{-(0)^2 + (0) - 4} \star = -4$

c) $f(4) = \boxed{-(4)^2 + (4) - 4} \star = -16$

2. A function g is defined by $g(t) = 5t^2 + t + 3$. Express the following function values in terms of x:

a) $g(x+2) = \boxed{5(x+2)^2 + (x+2) + 3} \star$

b) $g(x) + 2 = \boxed{\underbrace{(5(x)^2 + (x) + 3)}_{g(x)} + 2} \star$

3. Let $h(x)$ be defined on positive real numbers as follows:

1. Start with a number x.
2. Take the square root of the number and add 6 more than the number you started with.
3. Square the result and add 3 more than the original number.
4. Finally, divide the result by 2 less than the square of the original number.

Write a formula for $h(x)$.

$$\boxed{h(x) = \frac{((\sqrt{x} + (6+x))^2 + (x+3))}{((x)^2 - 2)}}$$

4. Find the domain of $f(x) = \sqrt{2x+9}$.

FACT square root $\sqrt{t}$ has domain $t \geq 0$

so $2x + 9 \geq 0$

$2x \geq -9$

$x \geq -\frac{9}{2}$ $\xrightarrow[\text{notation}]{\text{interval}}$ $\boxed{\left[-\frac{9}{2}, \infty\right)}$

5. Find the domain of $g(x) = \sqrt{x^2 - 16}$.

$x^2 - 16 \geq 0$

$x^2 \geq 16$

happens when:

$x \geq 4$ OR $x \leq (-4)$ $\xrightarrow[\text{notation}]{\text{interval}}$ $\boxed{(-\infty, -4] \cup [4, \infty)}$

B A

A "OR" B

6. Let $h(x)$ be a *linear function* such that $h(3) = 3$ and $h(4) = 0$.

a) List two points which are on the graph of $h(x)$.

$\boxed{(3,3) \ \& \ (4,0)}$

b) $h(x)$ is linear, so its graph is a line. Find the slope of the graph of $h(x)$ using your answer to a).

$m = \boxed{\frac{0-3}{4-3}} = -\frac{3}{1}$

c) Find an expression $h(x)$.

$\underbrace{h(x)}_{\text{"y"}} - \underbrace{3}_{\text{"}y_1\text{"}} = \underbrace{\left(-\frac{3}{1}\right)}_{\text{"m"}}(x - \underbrace{3}_{\text{"}x_1\text{"}})$

Solve for h:

$\boxed{h(x) = \left(-\frac{3}{1}\right)(x-3) + 3}$ ☆