

Name \_\_\_\_\_  
Date \_\_\_\_\_

**Advanced Algebra**  
**Unit 2: Families of Functions**  
**Homework #5**

Given  $f(x) = 4x - 5$  and  $g(x) = x^2 + 2$

1. Find  $f(6)$  19
2. find  $f(0)$  -5
3. Find  $x$  if  $f(x) = 22$   $\frac{27}{4}$        $22 = 4x - 5$
4.  $g(5)$  27
5.  $g(-2)$  6
6.  $f(8) + g(2)$  33
- 7)  $5 \cdot f(7)$  115
- 8) Find  $x$  if  $g(x) = 27$   $\pm 5$        $27 = x^2 + 2$   
 $25 = x^2$
- 9)  $f(12) - g(6)$  5

10) Describe with a short answer what happens to  $f(x) = (x-5)^2 - 6$

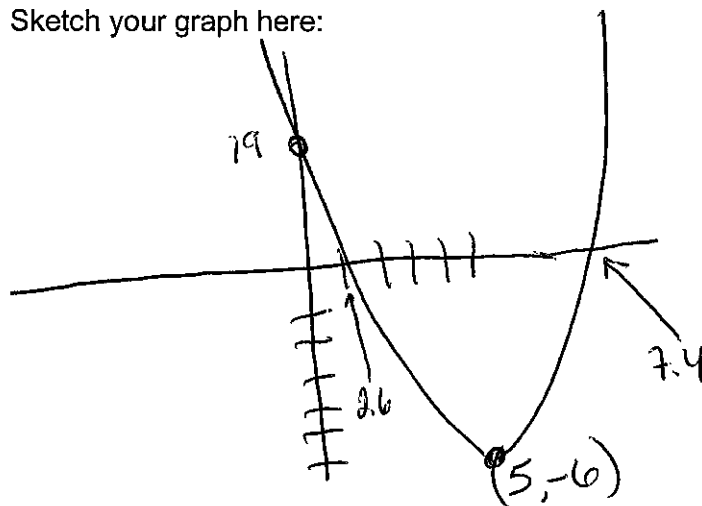
The parent family is Quadratic  
The horizontal shift is 5 units to the right  
The vertical shift is 6 units down

$$(x-5)^2 - 6 = 0$$

$$x-5 = \pm\sqrt{6}$$

$$x-5 = \pm 2.4$$

Sketch your graph here:



What is the x intercept?  
7.4 and 2.6

What is the y intercept?  
19

Does this function have a maxima or minima? If so what?  
(5, -6)

$$y = (0-5)^2 - 6$$

$$19$$

I can solve:

Solve the following equations:

11)  $0 = 3(x-2)^3 - 5$

$$\begin{aligned} 3(x-2)^3 - 5 &= 0 \\ 3(x-2)^3 &= \frac{5}{3} \\ (x-2)^3 &= \frac{5}{9} \\ x-2 &= \sqrt[3]{\frac{5}{9}} \\ x &= 2 + \sqrt[3]{\frac{5}{9}} \approx 2.1856 \end{aligned}$$

12)  $0 = (x-2)^2 - 28$  (should be 2 answers)

$$\begin{aligned} (x-2)^2 - 28 &= 0 \\ (x-2)^2 &= 28 \\ x-2 &= \pm\sqrt{28} \\ x &= 2 \pm \sqrt{28} \approx 2 \pm 5.29 \\ x &= 7.29 \text{ or } -3.29 \end{aligned}$$

13)  $0 = 2|x-18| - 22$  (Should be 2 answers)

$$\begin{aligned} 2|x-18| - 22 &= 0 \\ |x-18| &= 11 \\ x-18 &= 11 \quad \text{or} \quad x-18 = -11 \\ x &= 29 \quad \text{or} \quad x = 7 \end{aligned}$$

LT: I understand function notation:

15)  $f(x) = 2(x-4)^2 + 4$

Find  $f(4)$   $(4)$

What is  $x$  when  $f(x) = 108$ ?

$$\begin{aligned} 2(x-4)^2 + 4 &= 108 \\ 2(x-4)^2 &= 104 \\ (x-4)^2 &= 52 \\ x-4 &= \pm\sqrt{52} \\ x &= 4 \pm \sqrt{52} \approx 11.2 \text{ or } -3.2 \end{aligned}$$

16)  $f(x) = 3(x-4)^3 + 18$

Find  $f(2)$   $(-6)$

Find  $x$  when  $f(x) = 205$

$$\begin{aligned} 3(x-4)^3 + 18 &= 205 \\ 3(x-4)^3 &= 187 \\ (x-4)^3 &= \frac{187}{3} \approx 62.333 \\ x-4 &= \sqrt[3]{62.333} \\ x &= 4 + \sqrt[3]{62.333} \approx 7.96 \end{aligned}$$

17) Given the general function  $y = f(x)$ , describe what the following does to the original graph

a)  $y = f(x) - 18$

Shifted down 18 Units

b)  $y = f(x) + 32$

Shifted up 32 Units

c)  $y = f(x-5)$

Shifted to the Rt 5 units

d)  $y = f(x-4) + 9$

Shifted 4 to the Right  
9 units up

e)  $y = 4f(x)$

4 times skinnier