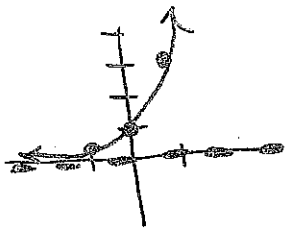
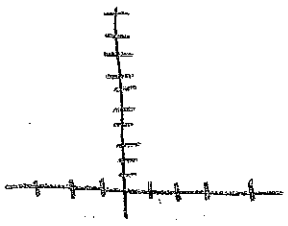
Ch 6 Review Name _____

Now you try.....

Read through each example carefully! Now, you try a similar one! When you're finished, check your answers in on the back page!

View the Example	Now you try
1. Simplify $(6x^5y^4)^3 =$ Rule: $(x^a)^b = x^{a \cdot b}$ $6^3(x^5)^3(y^4)^3$ $216x^{15}y^{12}$ Check: $6x^5y^4 \cdot 6x^5y^4 \cdot 6x^5y^4$ $216x^{15}y^{12}$ ✓	1. Simplify $(5a^3b^6)^2$
2. Write using rational exponents: $\sqrt[4]{10}$ $\sqrt[4]{10^1} = 10^{1/4}$ Rule: $\sqrt[b]{x^a} = x^{a/b}$ Write in radical form: $(6x^3z)^{\frac{5}{6}}$ $\sqrt[6]{(6x^3z)^5}$	2. Write using rational exponents: $\sqrt[5]{12}$ Write in radical form: $(8x^4z^5)^{\frac{4}{7}}$
3. Solve the equation: $(7^{x+3})^5 = 49$ Get the bases the same Rule: $(x^a)^b = x^{ab}$ $7^2 = 49$ $7^{5(x+3)} = 7^2$ $5(x+3) = 2$ $5x+15 = 2$ $5x = -13$ $x = -13/5$	3. Solve the equation: $(5^{x-2})^5 = 25$
4. Solve the equation: $4^{x-3} = 16$ Get the bases the same $4^{x-3} = 4^2$ $x-3 = 2$ $x = 5$	4. Solve the equation: $2^{x+5} = 8$
5. Complete the table and sketch: $y = 3^x$ x | y -1 | 1/3 0 | 1 1 | 3 	5. Complete the table and sketch: $y = 5^x$ x | y -1 0 1 

6. Identify the key features: $f(x) = 6^x$ Domain: all real #'s (you can put in any x-value) Range: all y values are bigger than 0 $y > 0$ Asymptote: $y = 0$ ← dotted line along x-axis y-intercept: 1 In $y = a \cdot b^x$, a is the y-int.	6. Identify the key features: $f(x) = 3^x$ Domain: Range: Asymptote: y-intercept:
7. Write an equation for the population after x weeks: A culture of bacteria begins with 100 and doubles each week $y = a \cdot b^x$ a = initial value (100) b = growth or decay factor (2) $y = 100(2)^x$	7. Write an equation for the population after x weeks: The weight of a new puppy begins at 5 ounces and triples each week
8. Write an exponential function: a = 2 b = 2 $y = a \cdot b^x$ $y = 2 \cdot 2^x$	8. Write an exponential function: x: 0, 1, 2, 3, 4 y: 100, 50, 25, 12.5, 6.25
9. $400 is invested at 7% compounded monthly. What is the investment worth in 6 years? $A = P(1 + \frac{r}{n})^{nt}$ P = 400 r = .07 n = 12 t = 6 n = 12 $A = 400(1 + \frac{.07}{12})^{12 \cdot 6}$ = $608.04	9. $1250 is invested at 5% compounded monthly. What is the investment worth in 9 years?
10. The population of deer grows at 5% per year. Exponential growth or decay? Growth What is the growth/decay *rate*? 5% What is the growth/decay *factor*? 1.05 100% + 5% = 105% → 1.05	10. The population of mice decreases at 12% per year. Exponential growth or decay? What is the growth/decay *rate*? What is the growth/decay *factor*?

11. Write the explicit formula:

-6, -12, -24, -48, ...

$a_n = a_1 \cdot r^{n-1}$

$a_1 = -6$, $r = 2$

$a_n = -6(2)^{n-1}$

11. Write the explicit formula:

1, -3, 9, -27, ...

12. Find the 12th term:

2, -4, 8, -16, 32, ...

$a_n = a_1 \cdot r^{n-1}$

$a_1 = 2$, $r = -2$

To find 12th term, let $n = 12$

$a_{12} = 2(-2)^{12-1}$

$= -4096$

12. Find the 12th term:

-5, -20, -80, -320, ...

13. The explicit formula for a geometric sequence is $a_n = 6\left(\frac{3}{4}\right)^{n-1}$

a_1 ↑ ↖ r

$a_n = a_1 \cdot r^{n-1}$

$a_1 = 6$

$r = 3/4$

Write the recursive formula:

$a_1 = 6$

$a_n = (a_{n-1})\left(\frac{3}{4}\right)$

Be sure to include both parts!

13. The explicit formula for a geometric sequence is $a_n = 3\left(\frac{1}{5}\right)^{n-1}$

Write the recursive formula:

14. How does the graph of $g(x) = 6 \cdot 4^x + 3$ compare to $f(x) = 6 \cdot 4^x$

g(x) will be 3 units up from f(x)

14. How does the graph of $g(x) = 5 \cdot 6^x - 2$ compare to $f(x) = 5 \cdot 6^x$

15. Graph $y = 4^x$ and $y = 3 \cdot 4^x$

Decide for each feature whether the two graphs would be the same or different:

Domain: same (both "all real #s")

Range: same (both $y > 0$)

y-intercept: different (y-int at 1 vs. y-int at 3)

asymptote: same (both $y = 0$)

$y = 4^x$

$y = 1 \cdot 4^x$

$y = 3 \cdot 4^x$

15. Graph $y = 3^x$ and $y = 6 \cdot 3^x$

Decide for each feature whether the two graphs would be the same or different:

Domain:

Range:

y-intercept:

asymptote:

$y = 3^x$

$y = 6 \cdot 3^x$

Solutions:

1. $25a^6b^{12}$	2. $12^{1/5}\sqrt{(8x^4z^5)^4}$	3. $x = \frac{12}{5}$	4. $x = -2$	5.
6. Domain: all real #s, range: $y > 0$, asymptote: $y = 0$, y-int: 1	7. $y = 5(3)^x$	8. $y = 100\left(\frac{1}{2}\right)^x$	9. $1958.56	10. Decay rate: 12% factor: .88
11. $a_n = 1(-3)^{n-1}$	12. $-20,971,520$	13. $a_1 = 3$, $a_n = a_{n-1}\left(\frac{1}{5}\right)$	14. g(x) is 2 units down from f(x)	15. Domain - same, range - same, y-int: Different, asymptote: same