Integrated Math 1 Module 14 Review Name KEY

Find the common ratio r for each geometric sequence and use r to find the next three terms.

1. 5, 15, 45, 135 ... $r=3$

p.644 #1

405, 1215, 3645

2. −2, 6, −18, 54 ... $r=-3$

p.644 #2

−162, 486, −1458

3. **Physical Science** A ball is dropped from a height of 625 centimeters. The table shows the height of each bounce. The heights form a geometric sequence. How high does the ball bounce on the 8th bounce?

p.646 #18

Bounce	Height (cm)
1	500
2	400
3	320

$500(.8)^{8-1}$

$f(n)=500(.8)^{n-1}$

$8^{th}=104.86$ cm

For each geometric sequence, write a recursive rule by finding the common ratio by calculating the ratio of consecutive terms. Write an explicit rule for the sequence by writing each term as the product of the first term and a power of the common ratio.

4. p.657 #1

n	1	2	3	4	5
a_n	2	6	18	54	162

$r=3$

R: $f(1)=2$

$f(n)=f(n-1)\cdot 3,\ n\geq 2$

E: $f(n)=2(3)^{n-1}$

p.659 #12

5. 5, 15, 45, 135, 405,... $r=3$

R: $f(1)=5$

$f(n)=f(n-1)\cdot 3,\ n\geq 2$

E: $f(n)=5(3)^{n-1}$

6. **Write an explicit rule for each geometric sequence using subscript notation. Use a calculator and round your answer to the nearest tenth if necessary.**

p.661 #21

Conservation A state began an effort to increase the deer population. In year 2 of the effort, the deer population in a state forest was 1200. In year 4, the population was 1728.

① ___, $\underset{a_2}{1200}$, ___, $\underset{a_4}{1728}$

② $a_3=a_2\cdot r$ $a_4=a_2\cdot r^2$

$a_4=a_3\cdot r$

③ $1728=1200r^2$

$1.44=r^2$

$1.2=r$

④ $1200=a_1(1.2)^1$

$1000\ a_1$

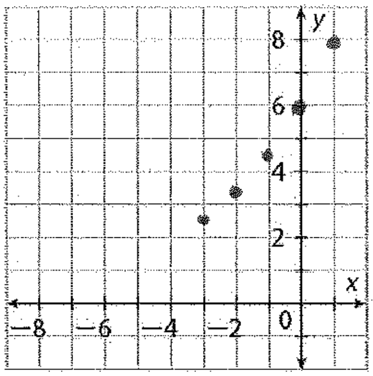
$\boxed{f(n)=1000(1.2)^{n-1}}$

7. Complete the table for each function using the given domain. Then graph the function using the ordered pairs from the table.

p.671 #4

$f(x) = 6\left(\frac{4}{3}\right)^x$; domain $= \{-3, -2, -1, 0, 1\}$

x	y
-3	2.53
-2	3.38
-1	4.5
0	6
1	8



8. Use two points to write an equation for the function.

p.672 #13

x	f(x)
1	2
2	$\frac{2}{7}$
3	$\frac{2}{49}$
4	$\frac{2}{343}$

$b = \frac{\frac{2}{7}}{2} = \frac{2}{7} \cdot \frac{1}{2} = \frac{1}{7}$

$f(1) = 2$

$(1, 2)$

$2 = a\left(\frac{1}{7}\right)^1$

or $7 \cdot 2 = \frac{1}{7}a \cdot 7$

$a = 14$

$\boxed{f(x) = 2\left(\frac{1}{7}\right)^{n-1}}$ or $\boxed{f(x) = 14\left(\frac{1}{7}\right)^x}$

Graph each exponential function. After graphing, identify a and b, the y - intercept, and the end behavior of the graph.

9. f(x) = 2^x

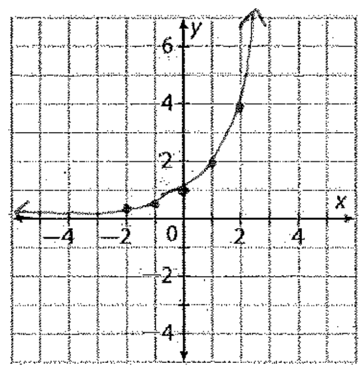
p.678 Ex.1

$a = 1$

$b = 2$

y-int $(0, 1)$

x	f(x)
-2	.25
-1	.5
0	1
1	2
2	4



End As $x \to +\infty$, $y \to +\infty$
$x \to -\infty$, $y \to 0$

Write an equation for the function.

10. When a piece of paper is folded in half, the total thickness doubles. Suppose an unfolded piece of paper is 0.1 millimeter thick. The total thickness $t(n)$ of the paper is an exponential function of the number of folds n.

p.667 Ex.2

$t(n) = .1(2)^n$