

Name: KEY Period: _____ Date: _____

SKILLS ASSESSMENT: Appendices A and B

Calculators permitted.

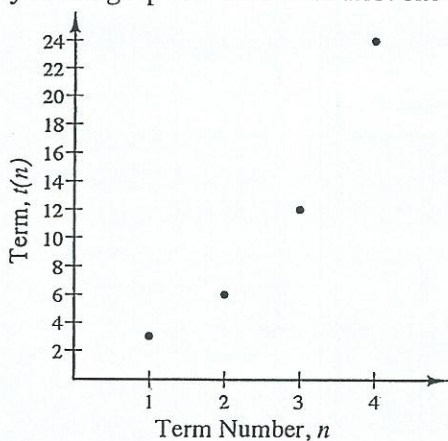
SA-1. For each sequence below, find the common difference or common multiplier. Write the next two terms of each sequence.

a. $-5, -2, 1, 4, \dots$ $7, 10$ $C.D. = +3$

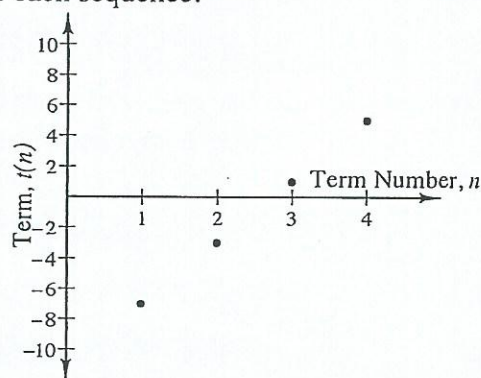
b. $81, 27, 9, \dots$ $3, 1, \dots$ $C.F. = \frac{1}{3}$

c. $24, 16, 8, 0, \dots$ $-8, -16$ $C.D. = -8$

SA-2. What is the common difference or common multiplier of each sequence represented by these graphs? Write the first six terms of each sequence.



$3, 6, 12, 24, 48, 96, \dots$
 $C.F. = 2$



$-7, -3, 1, 5, 9, 13, \dots$
 $C.D. = 4$

SKILLS ASSESSMENT: Appendices A and B

SA-3. Write an equation for the n^{th} term of each of the sequences represented in the table below.

c.d. = -1.5

Term Number, n	Term, $t(n)$
1	-16
2	-17.5
3	-19
4	-20.5
n	?

$$t(n) = -1.5n - 14.5$$

Term Number, n	Term, $t(n)$
1	8
2	32
3	128
4	512
n	?

c.f. = 4

$$t(n) = a(4)^n$$

$$t(n) = 2(4)^n$$

a = 2

SA-4. Reexamine the sequence $-5, -2, 1, 4, \dots$ from problem SA-1 above. Write an equation for the n^{th} term of the sequence. Consider -5 to be the first term ($n = 1$) of the sequence.

$$t(n) = 3n - 8$$

SKILLS ASSESSMENT: Appendices A and B

SA-5. Marissa wrote the equation $t(n) = 15 + 7n$ for a sequence she was thinking about. Is it possible that 94 is part of her sequence? Explain.

$$94 = 15 + 7n$$

$$79 = 7n$$

$$11.3 = n$$

No, n does not calculate to an even term number

SA-6. Use the graph at right to answer these questions.

a. What is the common multiplier for the sequence represented in the graph?

3

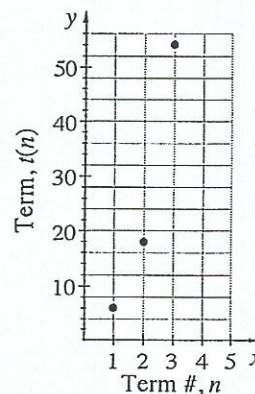
b. Write an equation for this sequence.

$$t(n) = 2(3)^n$$

c. What is $t(n)$ when $n = 12$?

$$\begin{aligned} t(12) &= 2(3)^{12} \\ &= 2(531441) \end{aligned}$$

$$\underline{t(12) = 1062882}$$



6, 18, 54

$$a = \frac{75}{(5)^2} = \frac{75}{25} = 3$$

$$375 = ab^3 \quad 75 = ab^2$$

$$375 = (b^3) \left(\frac{75}{b^2} \right) \quad a = \frac{75}{b^2}$$

$$375 = 75b \Rightarrow b = 5$$

SKILLS ASSESSMENT: Appendices A and B

SA-7. The graph to the right is an exponential function.

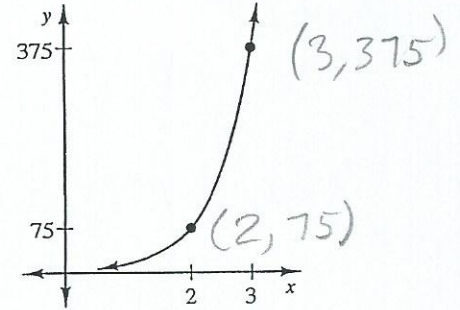
a. Write the equation of the function.

$$y = ab^x$$

$$y = 3(5)^x$$

b. What is the value of y when $x = -8$?

$$y = 3(5)^{-8} = .00000768$$



c. What is the y -intercept? What is the x -intercept?

$$y\text{-int} = 3(5)^0 = 3 \quad \text{No } x\text{-intercept}$$

SA-8. Katie brought home a gallon of her favorite Vanilla Choco Crunch ice cream. She wondered how long it would take to freeze very hard again. When she got home, she measured the ice cream's temperature to be 31.5°F . After two hours in the freezer, the temperature was 3.5°F . Katie made the table to the right.

Time (hr)	Temp. ($^\circ\text{F}$)
0	31.5
2	3.5

$$31.5 = a(b)^0$$

$$31.5 = a$$

$$3.5 = 31.5(b)^2$$

$$.111 = b$$

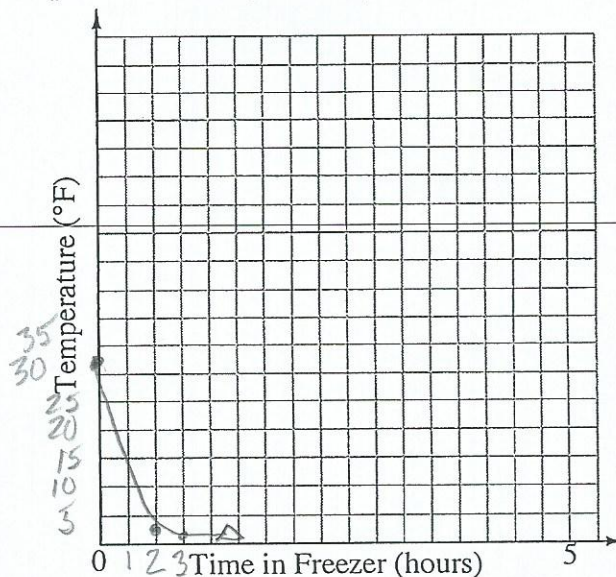
a. The relationship is exponential. Write an exponential function in the form $y = ab^x$ that relates the ice cream's time in the freezer to its temperature.

$$y = 31.5(.11)^x$$

b. After several days in the freezer, what temperature would the ice cream be very near to?

$$y = 31.5(.11)^3 = .042 \quad (\text{close to zero})$$

c. Draw a sketch of the freezing ice cream on the grid below. What is the x -intercept? What is the y -intercept?



$$\text{No } x\text{-int}$$

$$y\text{-int} (0, 31.5)$$

SKILLS ASSESSMENT: Appendices A and B

SA-9. In 2012 the average cost for a new mid-size car was about \$31,000. New car prices tend to go up about 2% every year.

a. What is the multiplier for this situation?

$$\boxed{1.02}$$

b. Write an expression that represents the cost in t years.

$$c(t) = 31000(1.02)^t$$

SA-10. As unique pieces of jewelry become well known, people start making and selling cheap copies of them. When this happens, the original jewelry quickly loses its value. Assume that a piece of jewelry was originally priced at \$80,000 because it was so unique. It loses 60% of its value every year.

a. Make a table of the value of the jewelry for the first four years.

yr	value
0	80000
1	32000
2	12800
3	5120
4	2048

b. Write a function to represent the value in t years.

$$v(t) = 80,000(0.4)^t$$

SA-11. Write each expression below using a radical sign and compute the value without using a calculator.



a. $216^{1/3} = \sqrt[3]{216}$
 $= 6$

b. $125^{4/3} = \sqrt[3]{125^4} = 5^4 = 625$

SA-12. Rewrite the following expressions using fractional exponents.

a. $(\sqrt[3]{17})^x$

$$17^{x/3}$$

b. $(\sqrt{3x})^3$

$$3x^{3/2}$$