

Integrated 1 Ch. 8 Team Test

Show all work for full credit. Pencil only.

Name: key

Team Member Name: _____

Team Member Name: _____

Team Member Name: _____

1. Simplify, leaving the expression with no parentheses and no negative exponents.

a. $\left(\frac{5}{7}\right)^{-1}$ $\left(\frac{7}{5}\right)$

b. $\frac{x^{-4}}{4} (3)^{-2}$
 $\frac{x^{-4}}{4} \cdot \frac{1}{9} = \frac{1}{36x^4}$

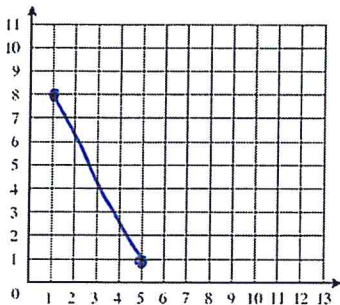
c. $(3x^{-3})(7^{-1})$
 $3x^{-3} \cdot \frac{1}{7} = \frac{3}{7x^3}$

d. $(3^{-1}x^2y^3)^3$
 $3^{-3}x^6y^9 = \frac{x^6y^9}{27}$

e. $\left(\frac{3a^3b^2}{4x^3y^4}\right)^{-1}$
 $\frac{4x^3y^4}{3a^3b^2}$

(2 pts each, ___/10 pts)

2. Plot the following points to form line segment \overline{AB} : $A(5,1)$ and $B(1,8)$



(2 pts each, ___/8 pts)

a) Use the Pythagorean Theorem to find the length of \overline{AB} :

$$\begin{aligned} (-7)^2 + 4^2 &= c^2 \\ 49 + 16 &= c^2 \\ \sqrt{65} &= c \end{aligned}$$

b) Find the midpoint of \overline{AB} :

$$\left(\frac{5+1}{2}, \frac{1+8}{2}\right)$$

$$\left(3, \frac{9}{2}\right)$$

c) Find the slope of \overline{AB} :

$$\frac{-7}{4}$$

d) Find the equation of the line through \overline{AB} :

$$y = mx + b$$

$$1 = \frac{-7}{4}(5) + b$$

$$b = 9.75$$

$$y = \frac{-7}{4}x + 9.75$$

3. A bacteria sample weighs 4 grams and is gaining 45% of its weight every hour. Write the equation, complete the table, graph the curve, and determine the weight of the sample in 10 hours.

equation	table		graph (sketch)	WORK-Weight in 10 hours:
$y = 4(1.45)^x$	x	y		$y = 4(1.45)^{10}$ $y = 164.34$
	-2	1.90		
	-1	2.76		
	0	4		
	1	5.8		
	2	8.41		

(3 points each, ___/12 pts)

4. The number of bacteria in a Petri dish triples every hour. If the dish started with 1500 bacteria, how many will there be in ten hours? Represent this situation with a table and an equation.

x	y
0	1500
1	4500
...	
10	88,573,500

bacteria!

Equation: $y = 1500(3^x)$

(4 points each, ___/8 pts)

5. In January, Nora placed \$5000 in an account that earns 9% annual interest compounded quarterly. What is the value of the account for each amount of the times shown below? Show your equation for each and answer.

a. At the end of the first quarter, in April?

b. After 10 years?

for 2018 skip

(2 points each, ___/4 pts)

6. Write the multiplier for all:

a) 11% decrease: $100 - 11 = 89$ <u>.89</u>	b) 7.5% tax $100 + 7.5 = 107.5$ <u>1.075</u>	c) 19% off sale: $100 - 19$ <u>.81</u>	d) gain of 21% <u>1.21</u>
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(2 points each, ___/8 pts)

7. A sequence is represented by the equation $t(n) = 5(3)^n$: Find the following:

$t(-2) = 5(3)^{-2}$ $\frac{5}{9}$	b. $t(0) = 5(3)^0 = 5$	c. $t(3) = 5(3)^3 = 135$
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(2 points each, ___/6 pts)

8. Examine the following sequences and answer the following questions:

n	0	1	2	3	4
t(n)	97	91	85	79	73

\downarrow \downarrow \downarrow \downarrow
 -6 -6 -6 -6

a. What type of sequence is t(n)?

Arithmetic

b. Write a rule for t(n).

$$a_n = 91 - 6(n-1)$$

$$a_n = 91 - 6n + 6$$

$$a_n = 97 - 6n$$

c. Find t(12)

$$a_{12} = 97 - 6(12)$$

$$a_{12} = 25$$

d. What term number in the sequence is equal to 121?

$$121 = 97 - 6n$$

$$24 = -6n$$

$$n = -4$$

(3 points each, ___/12 pts)

9. Examine the following sequences and answer the following questions:

n	1	2	3	4	5
t(n)	2	8	32	128	512

\downarrow \downarrow \downarrow
 $\times 4$ $\times 4$ $\times 4$

a. What type of sequence is t(n)?

Geometric

b. Write a rule for t(n).

$$a_n = 2(4)^{n-1}$$

d. Find t(10)

$$a_n = 2(4)^{10-1}$$

$$a_n = 524288$$

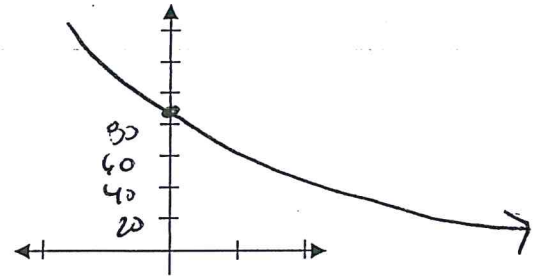
(3 points each, ___/9 pts)

10. Stock for SeersCo has been decreasing by 5% each month. Currently the stock is worth \$83 per share. Use tables or equations, but show your process in each question below.

a. Write an equation to represent the situation.

$$y = 83(.95)^x$$

b. Sketch and label a graph to represent this situation.



c. How much is the stock worth in 2 years?

$$x = 24 \quad y = 83(.95)^{24}$$

$$y = 24.24$$

d. How much was the stock worth four month ago?

$$x = -4 \quad y = 83(.95)^{-4}$$

$$y = 101.90$$

(3 points each, ___/12 pts)

11. Write the equation of the exponential function that passes through the given points. Show all of your work for full credit

a. (0,5) and (3,135)

$$5 = ab^0 \quad 135 = ab^3$$

$$\frac{135 = ab^3}{5 = ab^0}$$

$$27 = b^3$$

$$b = 3$$

$$5 = a(3)^0$$

$$a = 5$$

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

b. (5,8) and (3,32)

$$8 = ab^5 \quad 32 = ab^3$$

$$\frac{8 = ab^5}{32 = ab^3}$$

$$\sqrt{\frac{1}{4} = 75^2}$$

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

$$32 = a\left(\frac{1}{2}\right)^3$$

$$32 = a\left(\frac{1}{8}\right)$$

$$a = 256$$

$$y = 256\left(\frac{1}{2}\right)^x$$

(3 points each, ___/6 pts)

12. Solve for x:

$$\left(\frac{2}{5} + \frac{x}{4} = 5 - \frac{x}{2}\right)$$

$$\begin{array}{cccc} 8 & + & 5x & = & 100 & - & 10x \\ -8 & & +10x & & -8 & & +10x \end{array}$$

$$15x = 92$$

$$x = \frac{92}{15}$$

$$x \approx 6.133$$

(___/5 pts)