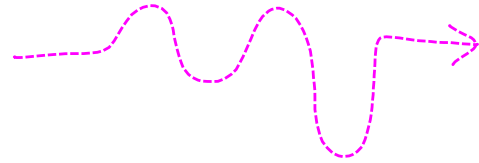


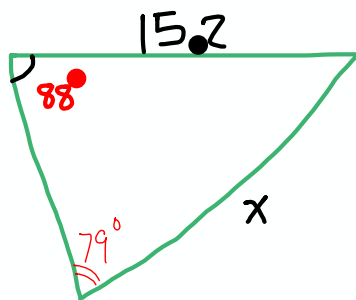
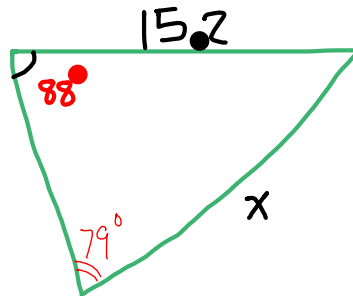
Questions on Homework



WARM UP

in your notes

Solve for x



AAS \rightarrow Law of Sines

ANSWERS TO HW

10

- a. x
 b. y^7
 c. $\frac{1}{4}$
 d. $64x^6$

23

- a. $b = t - an$
 b. $y = 3b + 3a$
 c. $y = mx$
 d. $x = \frac{y}{m}$

$$b = -an + t$$

$$y = 3(b+a)$$

88

$$y = -x - 2$$

$$5x - 3y = 22$$

↓
 Solution
 $(2, -4)$

91

B

92

- a. $y = 2x - 3$
 b. $y = -3x - 1$
 c. $y = \frac{2}{3}x - 2$
 d. $y \approx \frac{2}{3}x + 9$

116

a. $y = 23500(.85)^x$
 worth \$ 2,052.82

b. $y = 14365112(1.12)^x$
 population
 138,570,081

119

- a. arith
- b. geom
- c. neither
- d. arith.

120

- a. $t_n = 7 - 3n$ or $t_n = 4 - 3(n-1)$
- b. $t_n = 5(1.2)^n$
or $6(1.2)^{n-1}$

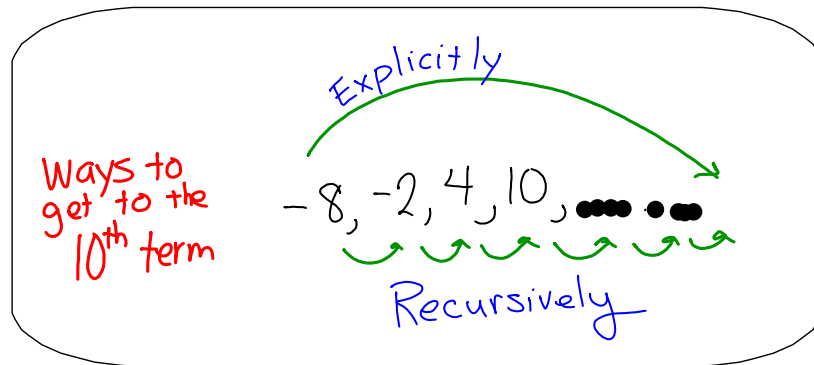
Today's Goal:

1. Write recursive formulas for sequences.
2. Exponential Function BASICS

No Notes yet
(Just some background
first)

occur
recur
recursive

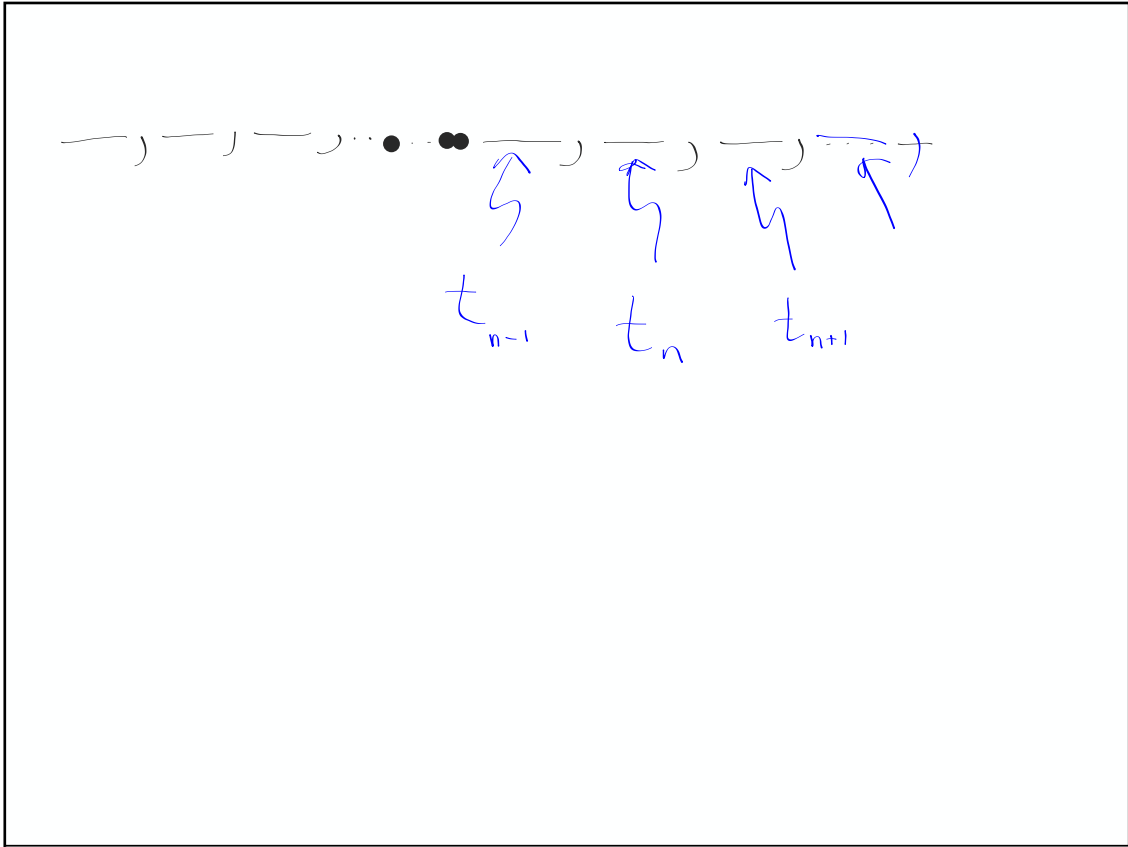
Explicit formulas can generate any term in the sequence.



Recursive formulas show how to produce *the next term* from a *known term*.

*What is the sequence
doing over and over again?*

**Recursive formulas
are used in computer
programming**



Notation

$t(n)$ or t_n

the current term

$t(n+1)$

the next term
after that term

$t(n-1)$

preceding term

Pick up the handout

and write

"Recursive formulas"
at the Top

Question #1

Write a sequence formula for each:

explicit formulas

recursive formula

Zero or first term format

20, 23, 26, 29.....

$$t_n = 20 + 3(n-1)$$

$$\begin{cases} t_1 = 20 \\ t_{n+1} = t_n + 3 \end{cases}$$

45, 40, 35, 30.....

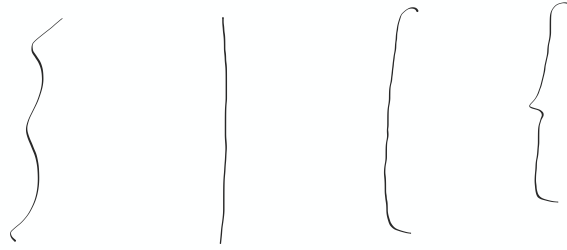
↓

Ⓢ

$$t_n = 45 - 5(n-1)$$

$$t_n = 50 - 5(n)$$

$$\begin{cases} t_1 = 45 \\ t_{n+1} = t_n - 5 \end{cases}$$



$$6, 12, 24, 48, \dots \quad \begin{cases} t_n = 6(2)^{n-1} \\ t_n = 3(2)^n \end{cases} \quad \begin{cases} t_1 = 6 \\ t_{n+1} = 2t_n \end{cases}$$

$$\underbrace{90, 30, 10, \dots} \quad \begin{cases} t_n = 90\left(\frac{1}{3}\right)^{n-1} \end{cases} \quad \begin{cases} t_1 = 90 \\ t_{n+1} = \frac{1}{3}t_n \end{cases}$$

Question #2

In a new sequence, what does the following mean?

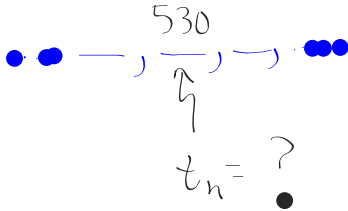
the 32nd term in the sequence is 1800.

$$t_{32} = 1800$$

$$t(32) = 1800$$

Question #3

Determine whether 530 is a term of the sequence $t(n) = 8 + 6n$



$$530 = 8 + 6n$$

$$522 = 6n$$

$$n = 87$$

So 530 is part of the sequence

Question #4

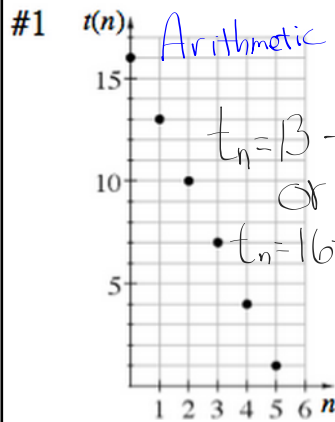
Given the recursive sequence below, list the first 5 terms of the sequence

$$\left\{ \begin{array}{l} t_1 = 3 \\ t_{n+1} = 5(t_n) - 1 \end{array} \right.$$

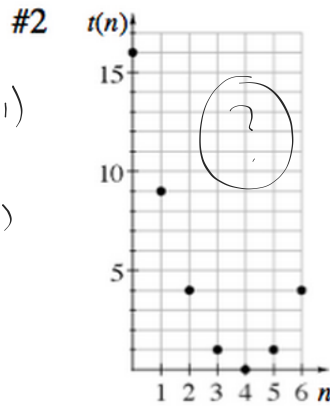
$$\underline{3}, \underline{14}, \underline{69}, \underline{344}, \dots$$

Question #5

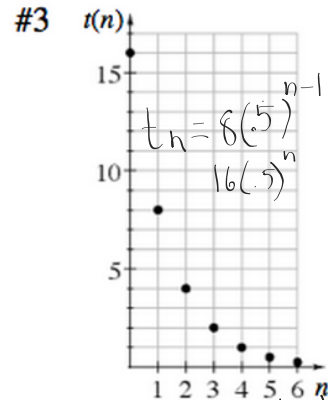
Write the first few terms of each sequence. Then identify each sequence as arithmetic, geometric or neither.



13 10 7 4 1



16 9 4 1 0 0



8 4 2 1 1/2

Question #6**Mystery sequence**

clues: $t(5) = 32$ and $t(11) = 56$

find the arithmetic sequence

12
① — — — — — 32 — — — — — 56
⑤ — — — — — ⑪

$$t_n = 4n + 12$$
$$12 + 4(n)$$
$$\frac{56 - 32}{11 - 5} = \frac{24}{6} = 4$$

B.B.

NOTES

Exponential Functions

Appendix B

$$y = ab^x$$

multiplier

y-intercept
initial value of a situation

$$y = 10(1.9)^x$$

Exponential functions in this form

$$y = ab^x$$


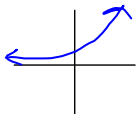
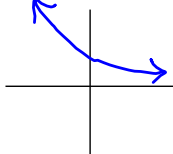
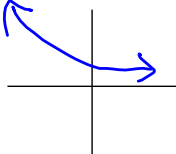
↑ multiplier

are only defined when:

$$b > 0 \quad b \neq 1$$



Get your GDC
ready

$y = 1(2)^x$		} Exponential Growth when $b > 1$
$y = 1(1.23)^x$		
$y = 1(0.35)^x$		} Exponential Decay $0 < b < 1$
$y = 1\left(\frac{2}{3}\right)^x$		

$y = 1(\cancel{3})^x$

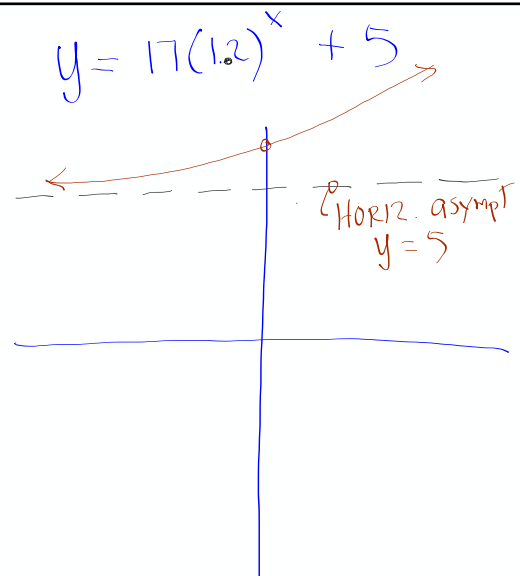
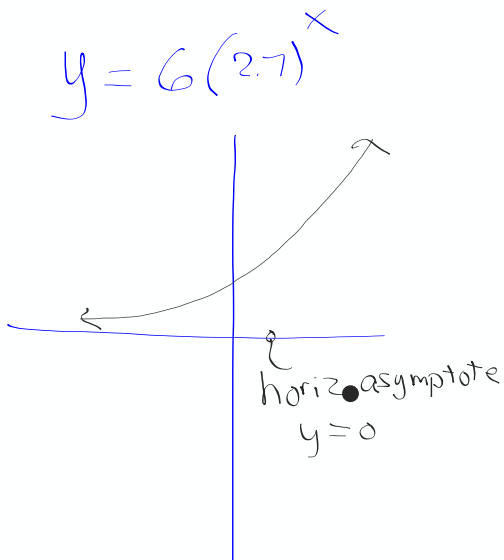
$$y = ab^x$$

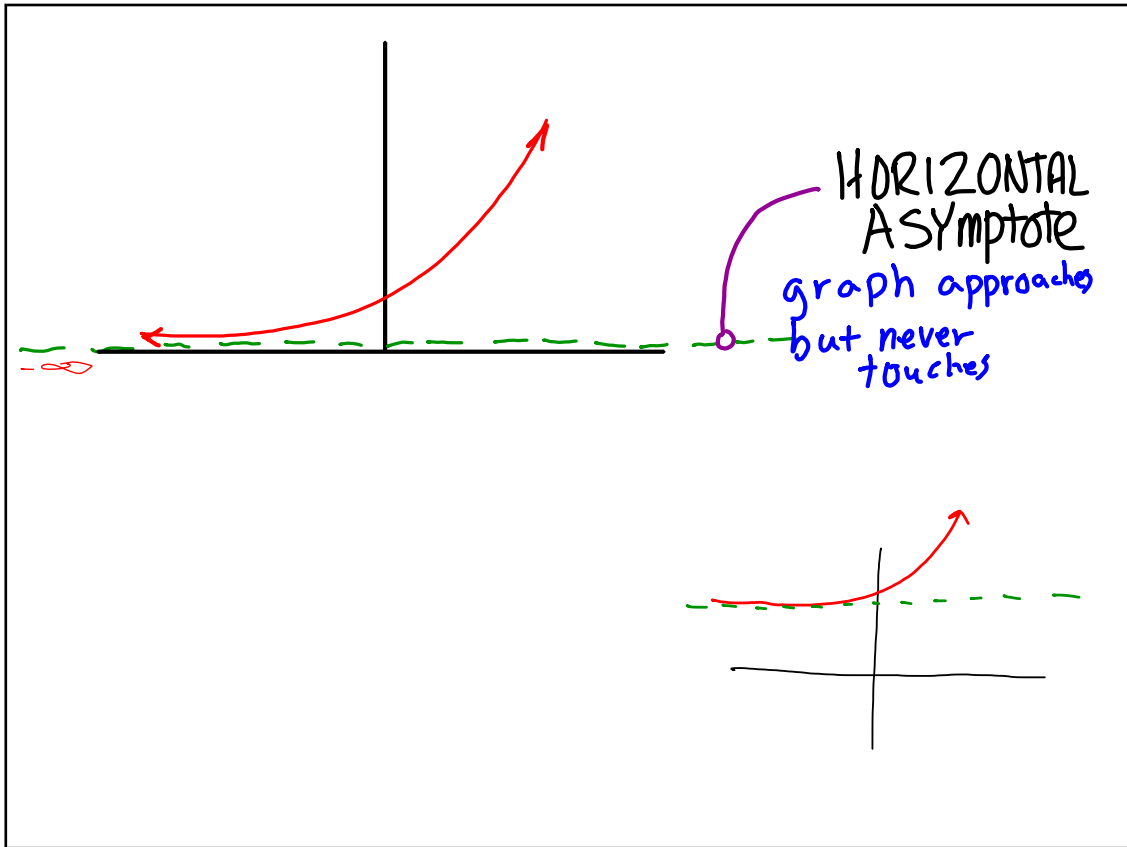
→ initial value of an exponential situation

→ y-intercept of its graph

How many of you
could sketch (w/o GDC)

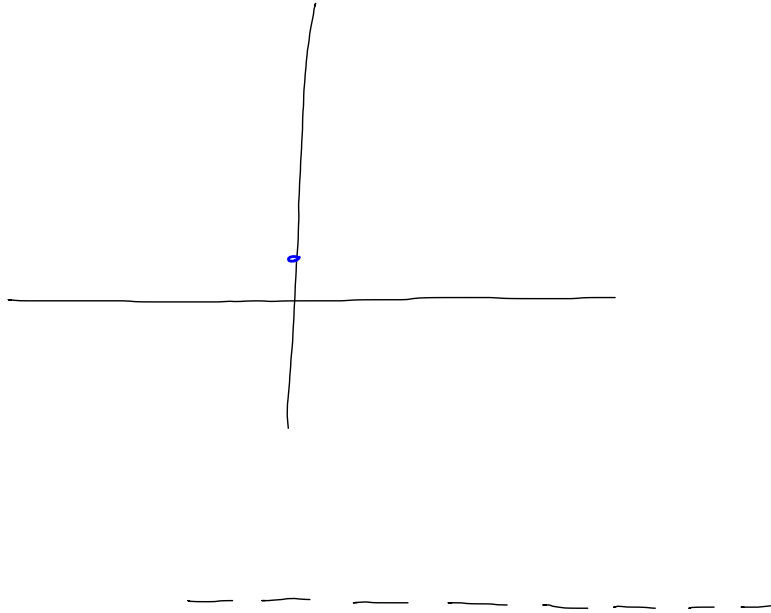
$$y = 6(2.7)^x \quad ?$$



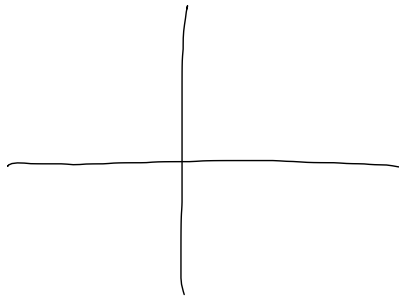


Turn
All GDC'S
upside down

Sketch $y = 2(3)^x + 5$



★ Sketch $y = 8\left(\frac{2}{3}\right)^x - 4$



Find the y-intercept analytically.

$$y = 3(2)^x$$

Graph and find the y-intercept.

Some common
issues I noticed
on the test

Anyone need to leave?
(have not taken test)

$$\sqrt{(x-4)^2} = \sqrt{25}$$

$$x-4 = \pm 5$$

$$x-4=5$$

$$x=1$$

$$x-4=-5$$

$$x=-9$$

$$(6)^2$$

$$36$$

$$(-6)^2$$

$$36$$

$$-(6)^2$$

$$-36$$

$$\bullet (-6)^2$$

$$-36$$

→

$$\frac{-4}{10} \quad \frac{4}{-10} \quad - \frac{4}{10} \quad \dots \rightarrow \quad -\frac{2}{5}$$

best 😊

NO "CUTSY" Fractions

$-4/10$

what happens
if you multiply by 2

$$\cancel{(-4/10)} \cdot 2$$

$$\left(-\frac{4}{10}\right) \cdot 2$$

Seeing your test :

✓ = 1 mark
✓✓ = 2 marks
✓✓✓ = 3 marks
✓✓✓✓ = 4 marks
etc

SS = See the Solutions

F.T.

You did the correct thing on this problem even though you used the incorrect answer from the previous problem.
(So I am not marking this problem wrong)

Assignment Appendix

A....24, 56, 78, 83, 99, 100

Exponent Review

Boot camp

Manipulating Powers

Exponent
LAWS
(add to your
notes)

$$1) (a^x)^y = a^{xy}$$

$$2) a^x \cdot a^y = a^{x+y}$$

$$3) \frac{a^x}{a^y} = a^{x-y}$$

$$4) (ab)^x = a^x b^x$$

$$5) \left(\frac{a}{b}\right)^x = \frac{a^x}{b^x}$$

$$6) a^{-x} = \frac{1}{a^x}$$

$$7) \frac{1}{a^{-x}} = a^x$$

Handout

Exponent LAWS
(Add to your notes)

1) $(a^x)^y = a^{xy}$ 4) $(ab)^x = a^x b^x$ 7) $\frac{1}{a^{-x}} = a^x$
 2) $a^x \cdot a^y = a^{x+y}$ 5) $\left(\frac{a}{b}\right)^x = \frac{a^x}{b^x}$
 3) $\frac{a^x}{a^y} = a^{x-y}$ 6) $a^{-x} = \frac{1}{a^x}$

Simplify each expression.
Example: $(x^2)^4 = x^{2 \cdot 4} = x^8$

1. $x^4 \cdot x^2 = x^6$
 Use the 2nd law

2. $\frac{x^8}{x^6} = x^2$

3. $(x^2 y)^3 = (x^2)^3 \cdot y^3 = x^6 y^3$

4. $\frac{x^5}{(x^3)^5} = \frac{x^5}{y^{15}}$

5. $y^{-15} = \frac{1}{y^{15}}$

6. $\frac{1}{x^{-15}} = \frac{x^{15}}{1} = x^{15}$

7. $\frac{a^6}{a^9} = \frac{1}{a^3}$

$$8. (2c^2)^3$$

$$2^3 \cdot (c^2)^3 = 8c^6$$

$$9. \frac{n^4 \cdot n^6}{n^8 \cdot n^2} = \frac{n^{10}}{n^{10}} = 1$$

$$10. 4a^5 \cdot 3a^3$$

$$12a^8$$

$$11. \left(\frac{v}{3}\right)^4 \cdot \left(\frac{5}{v}\right)^2$$

$$\frac{v^2 \cancel{v^4}}{81} \cdot \frac{25}{\cancel{v^2} 1}$$

$$= \frac{25v^2}{81}$$

$$12. (x^{-2})^2$$

$$x^{-4}$$

$$= \frac{1}{x^4}$$

$$13. \left(\frac{2}{x}\right)^{-1}$$

$$\frac{x}{2}$$

