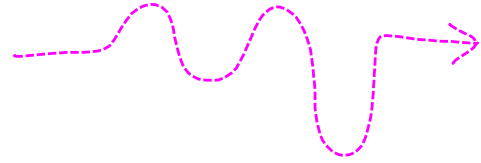


Questions on Homework



No Warm Up, but
have your homework out.

Exponent Review

Boot camp

Manipulating Powers

Exponent
LAWS
(add to your
notes)

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

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

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

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

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

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

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

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. $x^4 \cdot x^2$
 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. $\frac{a^6}{a^9} = \frac{1}{a^3}$

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

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

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

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

$$12a^8$$

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

$$\frac{v^2 \cancel{v^4}}{8^4} \cdot \frac{25}{\cancel{v^2}}$$

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

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

$$x^{-4}$$

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

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

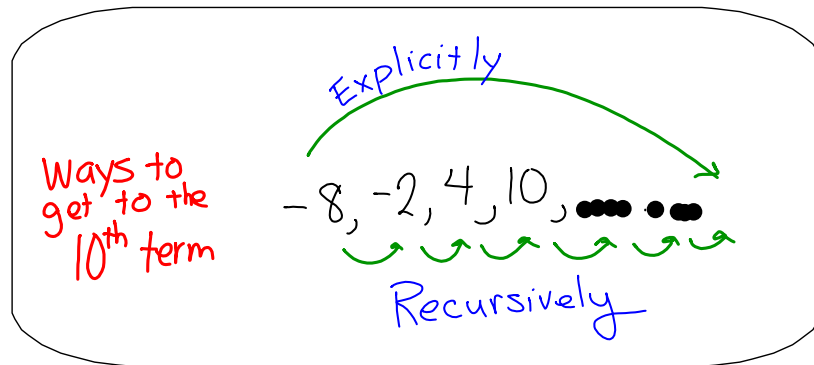
$$\frac{x}{2}$$

Check remainder
of assignment

Today's Goal:

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

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

Question #1**Write a sequence formula for each:**explicit
formulasrecursive
formulaZero or first term format

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

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

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

90, 30, 10,

Question #2

In a new sequence, what does the following mean? $t(32) = 1800$

Question #3

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

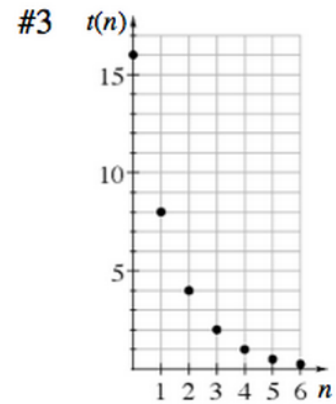
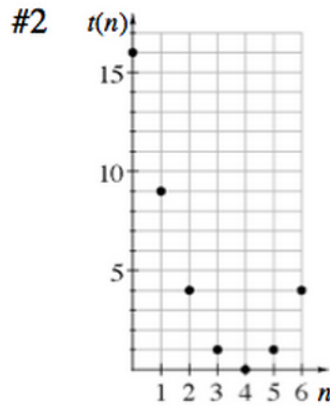
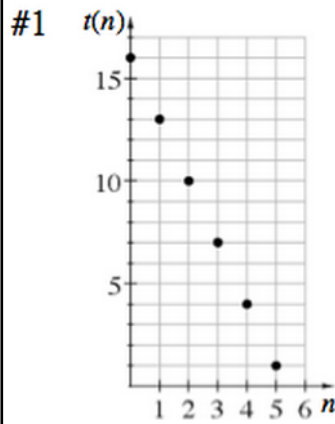
Question #4

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

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

Question #5

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

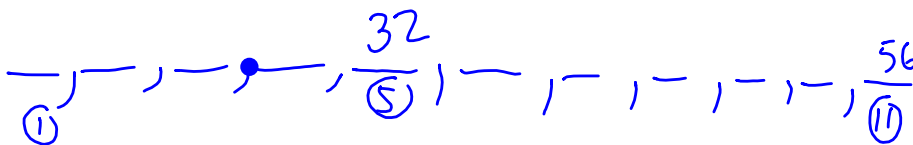


Question #6

Mystery sequence

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

find the arithmetic sequence



Consider taping these notes into yours.

B.B.

NOTES

Exponential Functions

Appendix B

Pull out your Reference Sheet

Exponential Functions $y = ab^x$, where b is the multiplier, a is the starting value

for % situations: \$200 increasing by 15% $\rightarrow y = 200(1 + .15)^t = 200(1.15)^t$

\$700 DECREASING by 15% $\rightarrow y = 700(1 - .15)^t = 200(0.85)^t$

Exponential functions in this form

$$y = ab^x$$

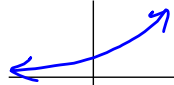
\uparrow multiplier

are only defined when:

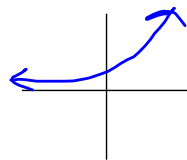
$$b > 0 \quad b \neq 1$$

Get your GDC
ready

$$y = 1(2)^x$$



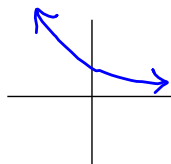
$$y = 1(1.23)^x$$



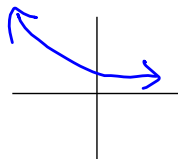
Exponential
Growth
when

$$b > 1$$

$$y = 1(0.35)^x$$

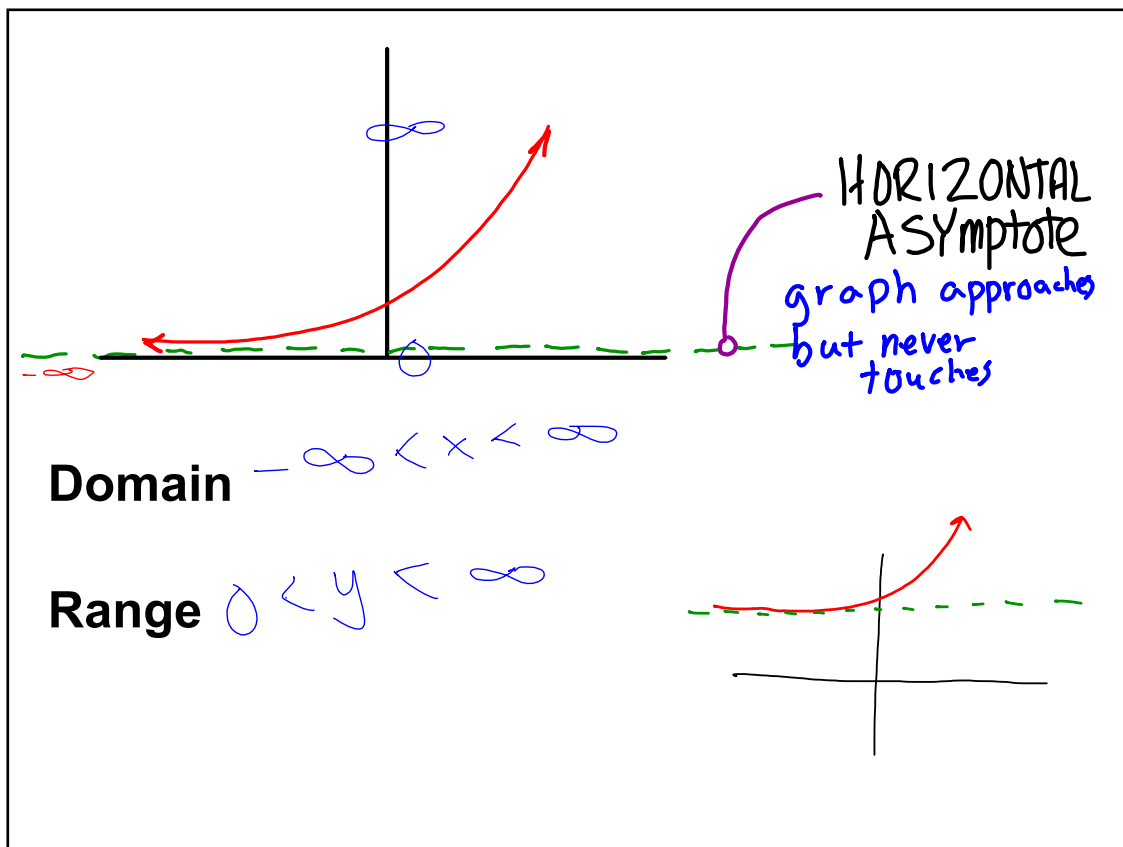
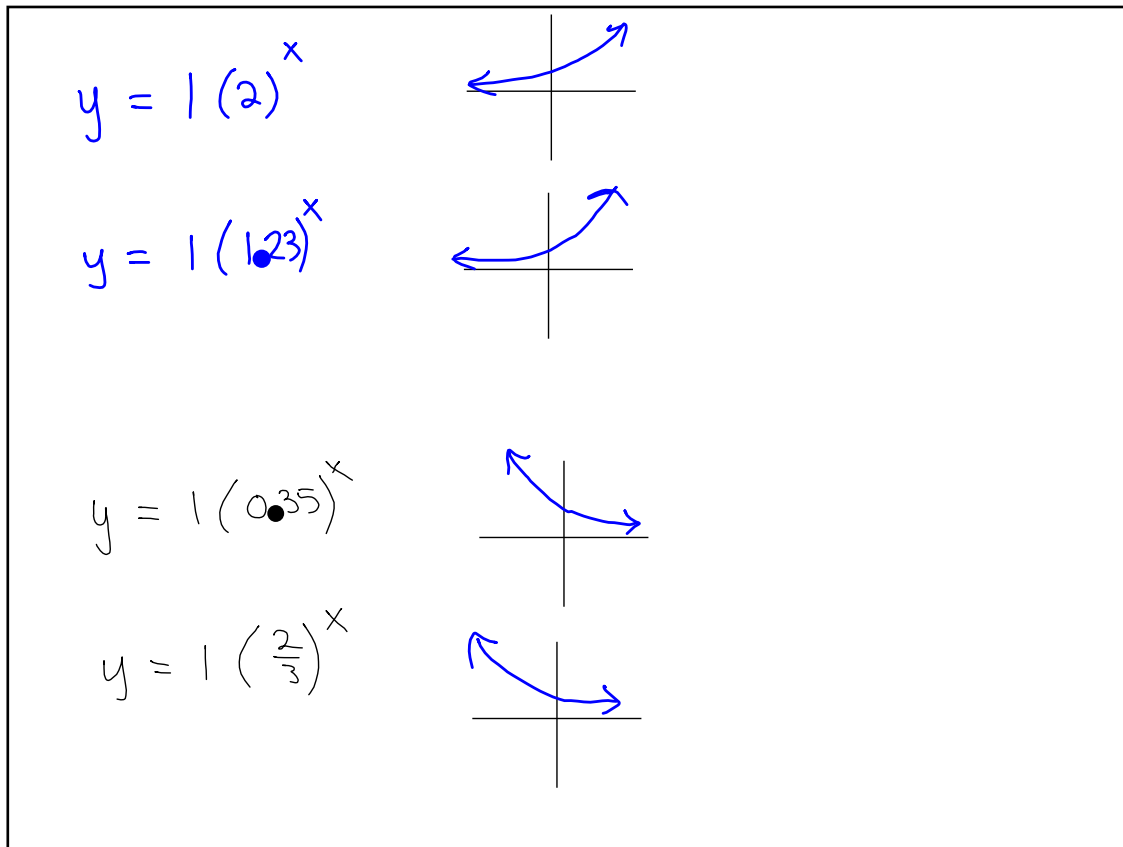


$$y = 1\left(\frac{2}{3}\right)^x$$



Exponential
Decay

$$0 < b < 1$$



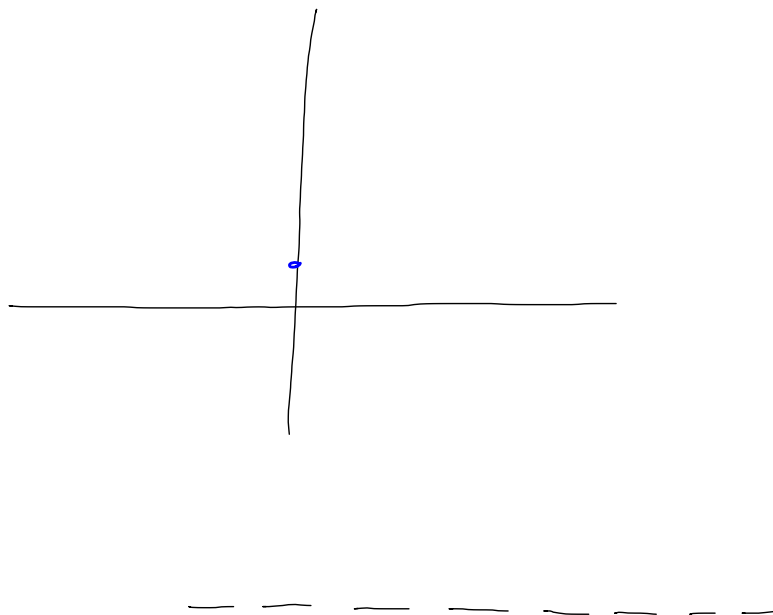
$$y = ab^x$$

Annotations:
- A green arrow points from the letter 'a' to the text "initial value of an exponential situation".
- A blue arrow points from the letter 'b' to the text "multiplier".
- A blue arrow points from the text "% growth" to the letter 'b'.

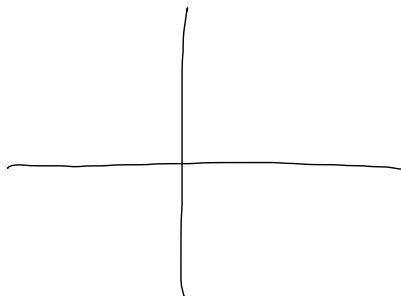
- initial value of an exponential situation
- y-intercept of its graph

but
not all exponentials
are basic

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.

Seeing your test :

✓ = 1 mark

✓✓ = 2 marks

✓✓✓ = 3 marks

✓✓✓✓ = 4 marks

(-2)

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)

$$(6)^2$$

$$36$$

$$(-6)^2$$

$$-6 \cdot -6$$

$$36$$

$$-(6)^2$$

$$-36$$

$$-6^2$$

$$-36$$

$$(x-4)^2 = 25$$

↓

NOT

$$x^2 - 16 = 25$$

(x)

Next
2 days

Assignment Appendix

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