Homework questions

Pick Up the WARM UP

and a Hershey's Choc. Kiss if you want

Arithmetic with a first term of 10

① 10, 17, 24, 31, ...

Is 10,200 a member of this sequence?

$t_n = 10 + 7(n-1)$

$10200 = 10 + 7(n-1)$

$-10 \quad -10$

$10190 = 7(n-1)$

divide by 7

$1455\frac{71}{7} = n-1$

$n = 1456.71$

not a whole #

so 10,200 is Not part of the seq.

② Simplify (means without negative exponents or parentheses)

$n^4 \frac{n^6}{n^2} = n^4$

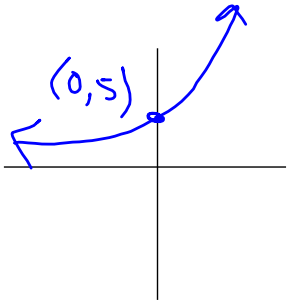
$\frac{n^5}{n^{-3}} = \frac{n^5 n^3}{1} = n^8$

$\frac{4x^{-2}}{x^3} = \frac{4}{x^3 x^2} = \frac{4}{x^5}$

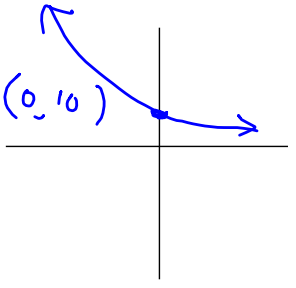
$\frac{1}{t^{-100}} = t^{100}$

3 Without using any type of a calculator, make a quick **sketch** of each graph below. Label the y-intercept.

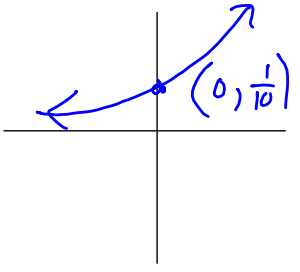
$y = 5(3)^x$



$y = 10\left(\frac{1}{2}\right)^x$

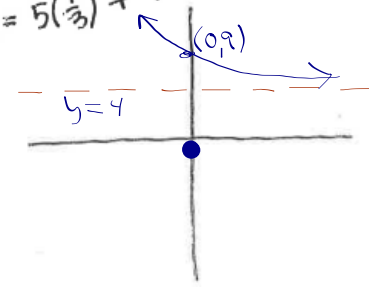


$y = \frac{1}{10}(5)^x$

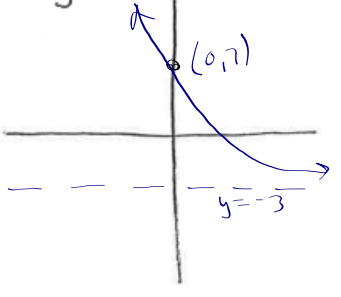


(4) Without a GDC, sketch

$y = 5\left(\frac{1}{3}\right)^x + 4$



$y = 10(1.3)^x - 3$



5) Suppose $y = 200(1.02)^x$ represents a

(a) population of ants growing by a constant percentage. What percent is the population growing by?

$1 + .02$

$100\% + 2\%$

50 2% growth

(b) What is the percent growth if the equation was $y = 50(1.26)^x$?

$1 + .26$

$100\% + 26\%$

26% growth

c) What if it was $y = 10000(.7)^x$?

70%

$= 100\% - 30\%$

% decay (reduction) is 30%

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Simplify without negative exponents

a) $10x^3 \cdot xy^2 = 10x^4y^2$

$n^{-1} = \frac{1}{n}$ b) $(3x)^{-1} = \frac{1}{(3x)^1} = \frac{1}{3x}$

c) $(x^3y)^{-2} = \frac{1}{(x^3y)^2} = \frac{1}{x^6y^2}$

$(x^3)^2$

$x^3 \cdot x^3$

Questions on HW

88 $y = -x - 2$ $5x - 3y = 22$

120 (a)

n	t(n
1	4
2	1
3	-2
4	

(b)

1	6
2	7.2
3	8.64
4	

Random HW Check

Yes or no?

Today's Aim

NOTES

Create An Exponential function from two given points.

when the asymptote is $y=0$

TABES or Graphs → Write exponential functions

- if the HA asymptote is $y=0$

① Table to Equation

$y = a b^x$

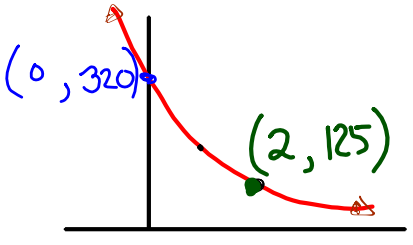
x	y
1	3.2
2	8
3	20
4	50

$y = 1.3(2.5)^x$

Very similar to their cousin, the Sequence

② Graphs to Equations

$y = a b^x$



x	y
0	320
1	
2	125
3	

$320 \cdot b \cdot b = 125$

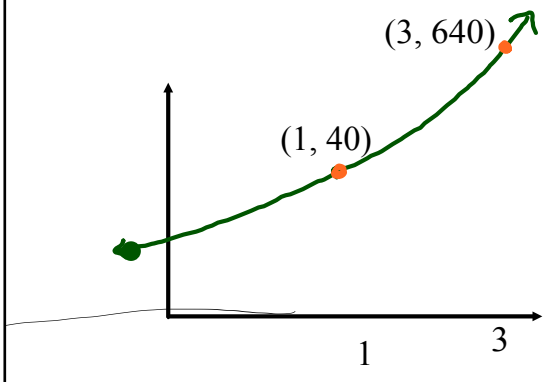
$320 \cdot b^2 = 125$

$b^2 = \frac{125}{320}$

$b = 5/8$ or $.625$

$y = 320\left(\frac{5}{8}\right)^x$

(3) In this question you will expand your skills. Think of it as a puzzle in which you are using clues to create an exponential equation.



x	y
0	10
1	40
2	160
3	640
4	

$40 \cdot b \cdot b = 640$

$40 \cdot b^2 = 640$

$b^2 = \frac{640}{40}$

$\sqrt{\quad} \quad \sqrt{\quad}$

$b = 4$

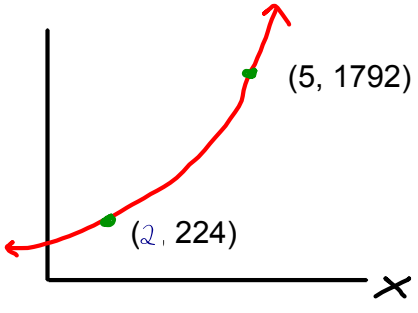
$y = 10(4)^x$

40, 640

(0) (1) (2) (3)

Or...

(4)



tomorrow

the asymptote won't be $y = 0$

or

the numbers won't be so friendly

BB

Exponential Boot Camp

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. Leave no expressions with negative exponents.

Example: $(x^2)^4 = x^{2 \cdot 4} = x^8$

1. $x^4 \cdot x^2$

x^6

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

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

$x^6 y^3$

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

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

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

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

8. $(2c^2)^3 = 8c^6$

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

10. $4a^5 \cdot 3a^3$ $12a^8$

11. $\left(\frac{v}{3}\right)^4 \cdot \left(\frac{5}{v}\right)^2 = \frac{v^4}{81} \cdot \frac{25}{v^2}$ $\frac{25v^2}{81}$ $\downarrow$ $\frac{25v^4}{81v^2}$

12. $(x^{-2})^2$ $\frac{1}{x^4}$

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

on your reference sheet

Exponential Boot Camp

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1. $x^4 \cdot x^2$

Tonight, on HW, there will be a question on solving an absolute value equation

example

$|n+3| - 5 = 20$

$|n+3| = 25$

$n+3 = 25 \quad n+3 = -25$

a simpler one first

$|x| = 9$

$|-9| = 9$

9

-9

On Friday there will be a quiz (not a test)

on items from the Appendix

- Sequences (Arithmetic, Geometric)
- Exponential functions
  - Some exponents
  - Other items you are seeing on assignments from this week

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on items from the Appendix

- Sequences (Arithmetic, Geometric) → Summary?
- Exponential functions
  - Some exponents
  - Other items you are seeing on assignments from this week

Summary SEQUENCES - Explicit Formulas

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Arithmetic	Geometric

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first term

common diff

Summary SEQUENCES - Explicit Formulas

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first term, common diff

$$t_n = t_1 + d(n-1)$$

or

$$t_n = t_0 + dn$$

Geometric

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$$t_n = t_1 (r)^{n-1}$$

or

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term #

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common ratio

t_0: 0 term

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or

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t_0: 0 term; d: comm diff.

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first term

$t_n = t_1 (r)^{n-1}$

or

$t_n = t_0 (r)^n$

common ratio

t_0: 0 term

n can only be a whole number

LCQ

Assignment

A...100, 121b, 123

end of Appendix A

B...35, 48, 61, 64, 85, 86b

Appendix B