

Before we begin, are there any questions from last day's work?

p.387 #1, 2a, 3a, 5, 6

Worksheet 1.5.3

Today's Learning Goal(s):

By the end of the class, I will be able to:

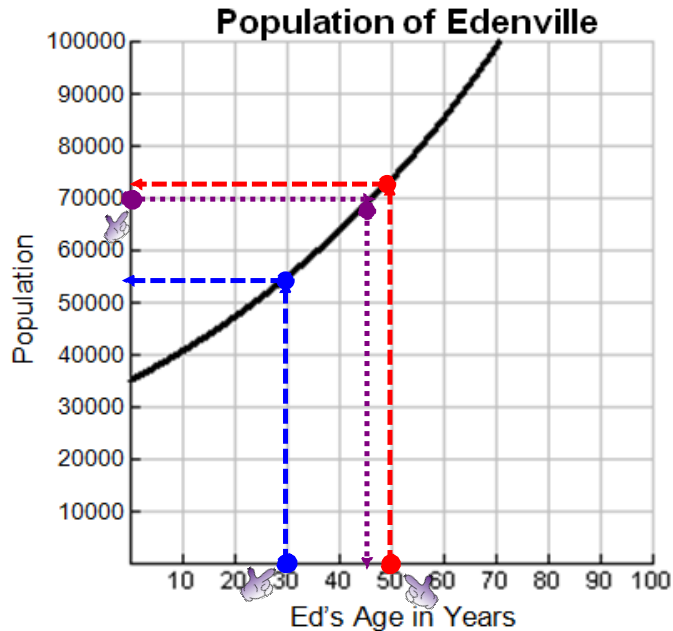
- a) draw upon prior knowledge of interpreting graphs
- b) recognize the logarithm of a number to a given base
as the exponent to which the base must be raised to get the number
- c) determine the approximate logarithm of a number to any base
by using systematic trial

1.6.1 Interpreting Graphs

Date: Sept. 13/18

When Ed was born, his town of Edenville had a population of 35 000.

The average yearly growth rate since then has been 1.5%. The population of the town is recorded in the graph below.



1. Using the graph, what was the population of Edenville on Ed's 30th birthday?

👉 tap above the **blue dot** (first)

👉 $\hat{=}$ **55 000** (half way between 50 000 and 60 000)

2. Using the graph, what was the population of Edenville on Ed's 50th birthday?

👉 tap above the **red dot** (next)

👉 $\hat{=}$ **72 250** (about $\frac{1}{4}$ way between 70 000 and 80 000)

3. How old will Ed be when the population of the town doubles in size from the time he was born?

👉 tap to the right of the **purple dot** (3rd)

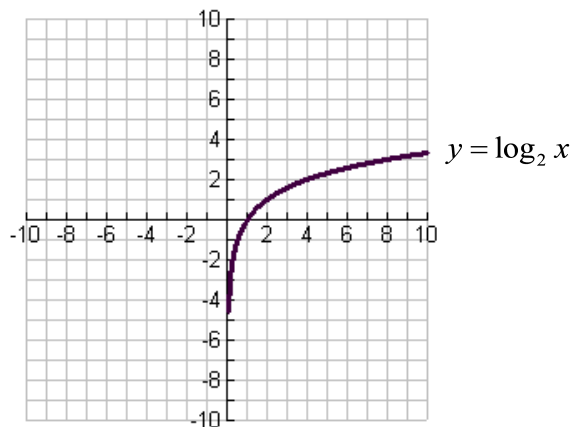
👉 $\hat{=}$ **Use 70 000 \therefore between 45 and 47 years old**

4. Explain how the characteristics of the graph may indicate exponential growth.

👉 -it is non-linear

👉 -it is increasing in steepness from left to right

1.6.2 Approximate Logarithms of a Number

Date: Sep. 13/18Consider the graph of $y = \log_2 x$ 

1. Using the graph of $y = \log_2 x$, if $x = 2$ determine the value of y .

$$\text{👉 } y = \log_2 2$$

$$\text{👉 } \therefore y = 1$$

2. Using the graph of $y = \log_2 x$, if $x = 4$ determine the value of y .

$$\text{👉 } y = \log_2 4$$

$$\text{👉 } \therefore y = 2$$

3. Using the graph of $y = \log_2 x$, if $x = 8$ determine the value of y .

$$\text{👉 } y = \log_2 8$$

$$\text{👉 } \therefore y = 3$$

4. How would you evaluate $\log_2 32$, without using the graph? Explain your reasoning.

👉 The log function is "exponential".

$$\text{👉 } \therefore 2^y = 32$$

$$\text{👉 } \therefore y = 5$$

5. In your groups, discuss how you would evaluate $\log_2 6$, both with and without the graph.

👉 With the graph: $x = 6$ (between 2.5 & 2.7) $\therefore y \doteq 2.6$

👉 Without the graph, $\therefore 2^y = 6$ (then use trial and error)

(See next slide)

Read pp.336-337, then complete p.338 #4, 6, 7

Complete 1.6.3 "Breaking Logs" activity.
If away, then begin tomorrow's lesson with it.

$$\text{Base}^{\text{Exponent}} = \text{Answer}$$

ex) $2^3 = 8$

$$\text{LOG}_{\text{Base}} \text{Answer} = \text{Exponent}$$

ex) $\log_2 8 = 3$

Review the learning goals. Were we successful today?

Homework: Read pp.336-337

p. 338 # 4, 6, 7

Answer any remaining homework questions

Students ask for "at desk" clarification.