Problem-Based Task: Money in Your Pocket

Coaching Sample Responses

a. What equation models Option A?

Option A must be an exponential function because it increases by a constant multiple or percentage (20%) each year. To calculate your annual salary under Option A, you can multiply your starting salary by 1.2 raised to the number of years.

$$M(x) = 50{,}000(1.2)^x$$

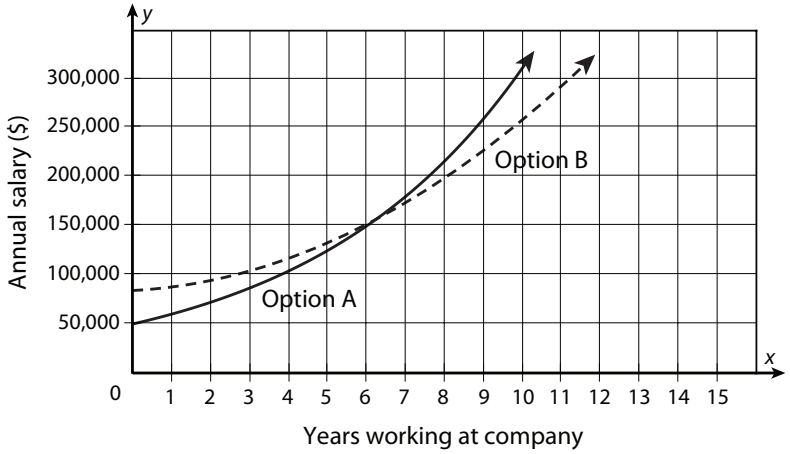
b. How much will you make in salary for the first 10 years under each option?

Use the two functions to create a table of values for the first 10 years under each option.

Year	0	1	2	3	4	5	6	7	8	9	10
Option A salaries (in thousands)	50	60	72	86.4	103.68	124.42	149.3	179.16	214.99	257.0	309.59
Option B salaries (in thousands)	84	87.53	94.12	103.77	116.48	132.25	151.08	172.97	197.92	225.93	257.0

c. What do the graphs tell you about rate of change of each option?

Plot the points from the table, and connect the curves to create graphs of each function.



Based on the graphs, Option B makes the most money for the first few years. However, after 6 years with the company Option A overtakes Option B. The rate of change of Option A is greater than Option B.

d. Which salary option should you choose if you plan to work for the company for 5 years?

Looking at the table of values, Option A pays $124,420 after 5 years. Option B pays $135,250 after 5 years.

Looking at the graphs, Option B is higher than Option A when $x = 5$ years.

If you only plan to work for the company for 5 years, Option B is your best choice.

e. Which salary option should you choose if you plan to work for the company until you retire at age 65?

By looking at the graph, it is obvious that Option A exceeds Option B after 6 years.

Exponential functions eventually exceed quadratic functions.

If you plan to work for the company until retirement, Option A is the best choice.

Recommended Closure Activity

Select one or more of the essential questions for a class discussion or as a journal entry prompt.