Plan 1:

day	1	2	3	4	5	6	7	8
min	5	6	7	8	9	10	11	12

Bell Work: 1-31-19

Your team wants to practice a drill for a certain amount of time each day. Which plan will give your team more total practice time over 4 days? Over 8 days?. Explain your reasoning.

Plan 2

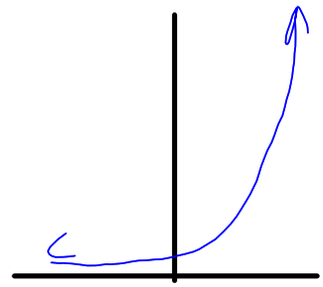
day	1	2	3	4	5	6	7	8
min	1	2	4	8	16	32	64	128

Plan 1: 5 minutes today, then 1 minute more each day that the previous day

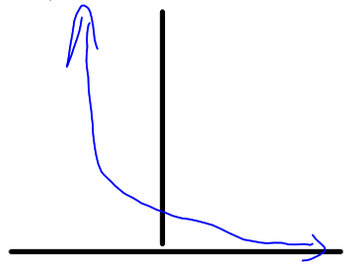
Plan 2: 1 minute today and then twice as much time each day as the previous day.

Exponential function is $y = a \cdot b^x$

Exponential Growth is when $b > 1$



Exponential Decay is when $0 < b < 1$



* based on what the right side of the graph is doing

Identify the initial amount a and the growth factor b in each exponential function.

$y = a\,b^{x}$

$b \neq 1$

$b > 1$

1) $f(x) = 3 \cdot 5^x$

Initial (a) = 3

Growth factor (b) = 5

5 = 500%

2) $h(x) = 5 \cdot 1.02^x$

Initial (a) = 5

Growth factor (b) = 1.02

1 = 100%

.02 = 2%

102% = 1.02

Find the balance in each account after the given period.

3) $2000 principal earning 5.4% compounded annually, after 4 yr

a r n

5 4 % = . 0 5 4

$y = a(1 + r)^n$

$2000(1+.054)^4$

$2000(1.054)^4$

$2000\ (1.234134359)$

2468.268

$\$2468.27$

Identify the initial amount *a* and the decay factor *b* in each exponential function.

$0 < b < 1$

4) $y = 4 \cdot 0.2^x$

Initial (a) = 4

Growth / Decay (b) = 0.2

Tell whether the equation represents *exponential growth*, *exponential decay*, or *neither*.

growth or decay: x has to be written as an exponent

5) $y = 2 \cdot 3^x$ — $b = 3$ — Growth

6) $f(x) = 6 \cdot 0.5^x$ — $b = 0.5$ — decay

7) $f(x) = 5 \cdot x^2$ — neither — $b = x$

8) $y = 0.3^x$ — $b = 0.3$ — decay

9) The town manager reports that incoming revenues for a given year were $2 million. The budget director predicts that revenues will increase by 4% per year. How much revenue will the town have available 10 years from the date of the town manager's report if the equation that models the growth is $f(x) = 2{,}000{,}000 \cdot (1.04)^x$?

$f(x) = a(b)^x$

$a = 2{,}000{,}000$

$b = 1.04 = 104\%$

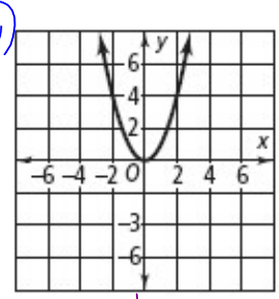
$x = 10$

$f(x) = 2{,}000{,}000(1.04)^{10}$

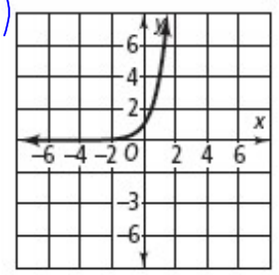
$f(x) = 2{,}000{,}000\,(1.480244285)$

$f(x) = \$2{,}960{,}488.57$

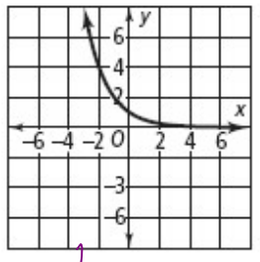
Tell whether each represents an *exponential growth function*, an *exponential decay function*, or *neither*.

10) 

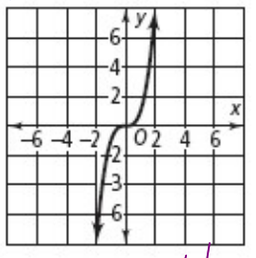
neither

11) 

growth

12) 

decay

(13) 

neither

Ticket out the door: Write equation and solve.

A family buys a car for $20,000. The value of the car decreases about 20% each year. After 6 years, the family decides to sell the car. How much is the car worth after 6 years?

(Hint: 20% decrease means the car is keeping 80% value. So 1-.20 = .80.)

Equation: $y = \$20{,}000(0.80)^x$