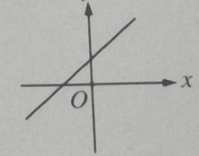
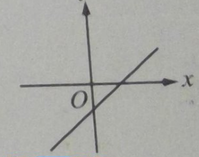
The sum of the measures in degrees of the angles of a triangle is 180.

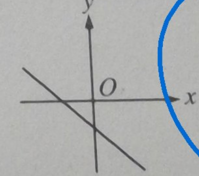
1. There is the same number of boys and girls on a school bus when it departs from school. At the first stop, 4 boys get off the bus and nobody gets on. After the first stop, there are twice as many girls as boys on the bus. How many girls are on the bus?

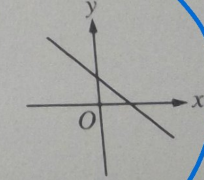
(A) 4
~~(B) 6~~
(C) 8
~~(D) 12~~
(E) 16

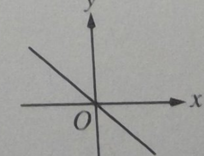
2. Which of the following is the graph of a linear function with a negative slope and a positive y-intercept?

(A)


(B)


(C)


(D)


(E)


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Questions 3-4 refer to the following price list.

Number of Donuts	Total Price
1	\$0.40
Box of 6	\$1.89
Box of 12	\$3.59

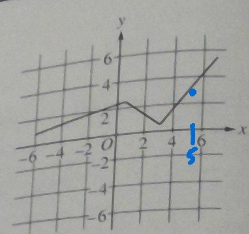
3. Of the following, which is the closest approximation of the cost per donut when one purchases a box of 6?

(A) \$0.20
(B) \$0.30
~~(C) \$0.40~~
(D) \$0.50
(E) \$0.60

12 + 6 + 3·1
3.59 + 1.89 + 3·.40
6.68

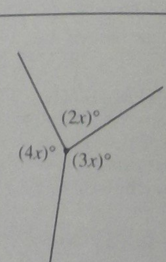
4. What would be the least amount of money needed to purchase exactly 21 donuts?

~~(A) \$5.88~~
(B) \$6.68
~~(C) \$7.10~~
(D) \$7.38
(E) \$8.40



5. The figure above shows the graph of the function h. Which of the following is closest to $h(5)$?

(A) 1
~~(B) 2~~
(C) 3
~~(D) 4~~
(E) 5



Note: Figure not drawn to scale.

6. In the figure above, three line segments meet at a point to form three angles. What is the value of x?

(A) 20
~~(B) 36~~
(C) 40

p 336 38

$A = 3000$

$r = .03$

$n = 12$

$t = \frac{1}{2}$

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$3000 = P\underbrace{\left(1 + \frac{.03}{12}\right)^{(12 \cdot \frac{1}{2})}}$$

$$3000 = P(1.015)$$

$$P = \$2955.39$$

29) $r = .08$

$n = 12$

P = initial investement

$2P$ = future value

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$2\cancel{P} = \cancel{P}\left(\underbrace{1 + \frac{.08}{12}}\right)^{12t}$$

$$2 = 1.00667^{12t}$$

$$\frac{\ln 2}{(12 \ln 1.00667)} = \frac{\cancel{12} t \cancel{\ln 1.00667}}{\cancel{12 \ln 1.00667}}$$

$$t = 8.69 \text{ years}$$

$$A = Pe^{rt}$$

$$2\cancel{P} = \cancel{P}e^{.08t}$$

$$\ln 2 = \ln e^{.08t}$$

$$\ln 2 = .08t$$

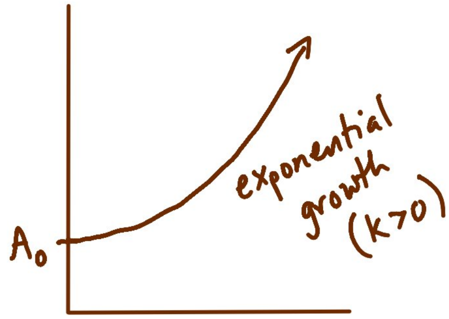
$$t = 8.66 \text{ years}$$

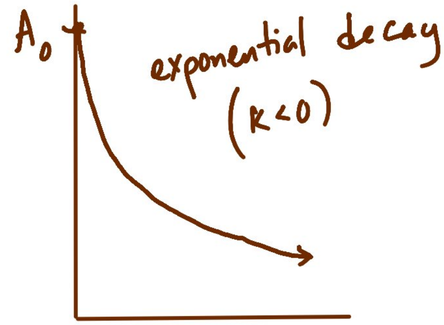
Section 4.7 Growth and Decay

Growth and Decay models follow the formula

$A = A_0 e^{kt}$ where A_0 is the initial amount (when $t=0$) and k is a constant $(k \neq 0)$

k is the growth (or decay) rate.





ex: $N(t) = 1000e^{0.07t}$

Bacteria after t hours

$A_0 = 1000$

$k = 0.07$ growth rate = 7%

a) How many bacteria are present in 12 hours?

$N(12) = 1000e^{0.07 \cdot 12} = 2{,}316$ bacteria

on calculator 1000 e ^ (.07 * 12)

b) How long will it take for the bacteria population to reach 5000?

$$\frac{5000}{1000} = \frac{\cancel{1000}e^{.07t}}{\cancel{1000}}$$

$$5 = e^{.07t}$$

$$\ln 5 = \ln e^{.07t}$$

$$\frac{\ln 5}{.07} = \frac{\cancel{.07}t}{\cancel{.07}}$$

$$t = 22.99 \text{ hours}$$

ex: A population of snakes is living under the school. At the beginning of the school year there were 112 snakes. 2 months later there were 275 snakes. How many will there be on the last day of school? (in 9 months)

$$A = A_0 e^{kt}$$

$$A = 112e^{kt}$$

$(2, 275)$
t, A

$$275 = 112e^{k \cdot 2}$$

$$2.455 = e^{2k}$$

$$\ln 2.455 = 2k$$

$$k = 0.449$$

$$A = 112e^{0.449t}$$

In 9 months

$$A = 112e^{0.449 \cdot 9}$$

$A = 6,370$ snakes

The half-life of something is the time it takes for half of the initial amount to be left.