Algebra 2 Bellwork Friday, April 8, 2016

1. $h = -16t^2 + vt + k$

The equation above gives the height h, in feet, of a ball t seconds after it is thrown straight up with an initial speed of v feet per second from a height of k feet. Which of the following gives v in terms of h, t, and k ?

A) $v = h + k - 16t$

B) $v = \dfrac{h - k + 16}{t}$

C) $v = \dfrac{h + k}{t} - 16t$

D) $v = \dfrac{h - k}{t} + 16t$

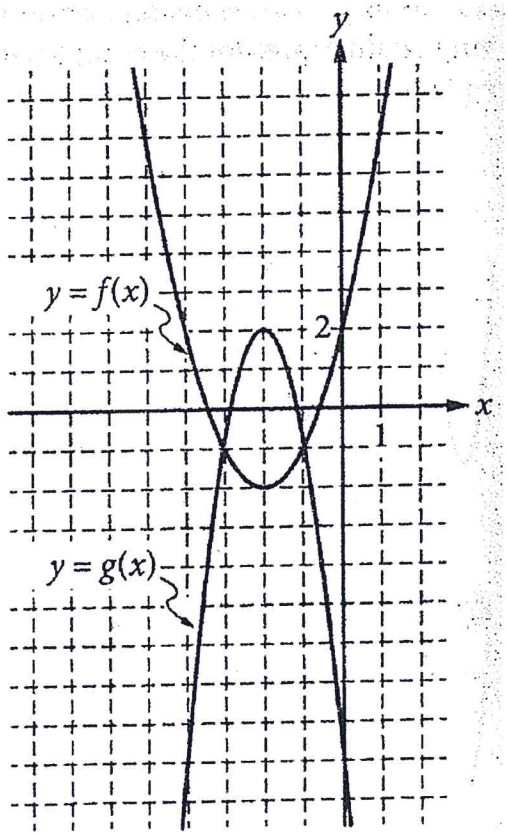
2. Graphene, which is used in the manufacture of integrated circuits, is so thin that a sheet weighing one ounce can cover up to 7 football fields. If a football field has an area of approximately $1\frac{1}{3}$ acres, about how many acres could 48 ounces of graphene cover?

A) 250
B) 350
C) 450
D) 1,350

3.

Graphs of the functions f and g are shown in the xy-plane above. For which of the following values of x does $f(x) + g(x) = 0$?

A) -3
B) -2
C) -1
D) 0



4 – 6 on the back

4.

The sum of three numbers is 855. One of the numbers, x, is 50% more than the sum of the other two numbers. What is the value of x ?

A) 570

B) 513

C) 214

D) 155

5.

In the xy-plane, the line determined by the points $(2, k)$ and $(k, 32)$ passes through the origin. Which of the following could be the value of k ?

A) 0

B) 4

C) 8

D) 16

6.

In planning maintenance for a city's infrastructure, a civil engineer estimates that, starting from the present, the population of the city will decrease by 10 percent every 20 years. If the present population of the city is 50,000, which of the following expressions represents the engineer's estimate of the population of the city t years from now?

A) $50{,}000(0.1)^{20t}$

B) $50{,}000(0.1)^{\frac{t}{20}}$

C) $50{,}000(0.9)^{20t}$

D) $50{,}000(0.9)^{\frac{t}{20}}$

ALG

Bellwork Answers

FRI
4-8-16

(1) $h = -16t^2 + Vt + k$

$-k \qquad\qquad -k$

$h - k = -16t^2 + Vt$

$+16t^2 \qquad +16t^2$

$\frac{h - k + 16t^2}{t} = \frac{Vt}{t}$

D

$$V = \frac{h-k}{t} + 16t$$

(2) $\frac{7 \text{ fields}}{\text{ounce}} \cdot 48 \text{ ounces} = 336 \text{ fields} \cdot 1\frac{1}{3}$

$= 336 \cdot \frac{4}{3} = 448 \text{ acres}$

C

(3) $f(x) + g(x) = 0$

$f(x)$ & $g(x)$ are y-values of the 2 graphs.

The only way $f(x) + g(x) = 0$ is if they are opposites.

B

The only location on the graph where $f(x)$ & $g(x)$ are opposites for the same value of x is when

$x = -2$ $\quad f(-2) = -2$ $\quad g(-2) = +2$

$-2 + 2 = 0$

(4) $x + y + z = 855$

B

$x = 1.5(y+z) \rightarrow \frac{x}{1.5} = y+z$

use substitution $x + \frac{x}{1.5} = 855$

$1.5\left(x + \frac{x}{1.5}\right) = 855 \cdot 1.5$

$1.5x + x = 1282.5$

$\frac{2.5x}{2.5} = \frac{1282.5}{2.5}$ $\quad x = 513$

(5) A line through the origin is direct variation. Direct variation is where $\frac{y}{x}$ is a constant ratio

C

$(2,k) \& (k,32) \rightarrow \frac{y}{x} = \frac{y}{x} \rightarrow \frac{k}{2} = \frac{32}{k}$

$k^2 = 64$

$k = \pm 8$

(6) This is exponential decay

D

eq: $y = a \cdot b^x$ ← # decay periods

a: initial amount

b: decay factor

$b \Rightarrow 100 - 10 = 90\% \rightarrow .9$

$a = 50{,}000$

$x =$ # 20 year periods $= \frac{\text{total time}}{20} = \frac{t}{20}$

$y = 50{,}000(.9)^{t/20}$