1. A company's manager estimated that the cost C, in dollars, of producing n items is $C = 7n + 350$. The company sells each item for \$12. The company makes a profit when the total income from selling a quantity of items is greater than the total cost of producing that quantity of items. Which of the following inequalities gives all possible values of n for which the manager estimates that the company will make a profit?

   A) $n < 70$
   B) $n < 84$
   C) $n > 70$
   D) $n > 84$

2. At a primate reserve, the mean age of all the male primates is 15 years, and the mean age of all female primates is 19 years. Which of the following must be true about the mean age m of the combined group of male and female primates at the primate reserve?

   A) $m = 17$
   B) $m > 17$
   C) $m < 17$
   D) $15 < m < 19$

3. The function f is defined by $f(x) = 2x^3 + 3x^2 + cx + 8$ where c is a constant. In the xy-plane, the graph of f intersects the x-axis at the three points $(-4, 0)$, $\left(\frac{1}{2}, 0\right)$, and $(p, 0)$. What is the value of c?

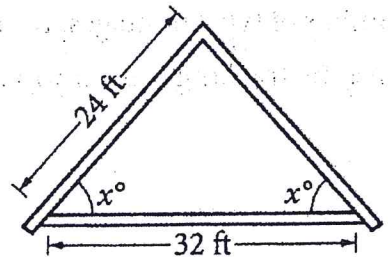
   A) -18
   B) -2
   C) 2
   D) 10

4-6 is on the back

4. A typical image taken of the surface of Mars by a camera is 11.2 gigabits in size. A tracking station on Earth can receive data from the spacecraft at a data rate of 3 megabits per second for a maximum of 11 hours each day. If 1 gigabit equals 1,024 megabits, what is the maximum number of typical images that the tracking station could receive from the camera each day?

5. If $-\frac{9}{5} < -3t + 1 < -\frac{7}{4}$, what is one possible value of $9t - 3$?

6. An architect drew the sketch below while designing a house roof. The dimensions shown are for the interior of the triangle.



Note: Figure not drawn to scale.

What is the value of $\cos x$?

ANSWERS

Algebra 2 Bellwork Wednesday, April 6, 2016

1. A company's manager estimated that the cost C, in dollars, of producing n items is $C = 7n + 350$. The company sells each item for \$12. The company makes a profit when the total income from selling a quantity of items is greater than the total cost of producing that quantity of items. Which of the following inequalities gives all possible values of n for which the manager estimates that the company will make a profit?

A) $n < 70$
B) $n < 84$
C) $n > 70$
D) $n > 84$

Cost
$C = 7n + 350$

Income
$12n$

Profit
income > cost
$12n > 7n + 350$
$5n > 350$
$n > 70$

2. At a primate reserve, the mean age of all the male primates is 15 years, and the mean age of all female primates is 19 years. Which of the following must be true about the mean age m of the combined group of male and female primates at the primate reserve?

A) $m = 17$
B) $m > 17$
C) $m < 17$
D) $15 < m < 19$

mean age of males = 15
mean age of females = 19
together mean can't be more than 19 nor can it be less than 15.

3. The function f is defined by $f(x) = 2x^3 + 3x^2 + cx + 8$ where c is a constant. In the xy-plane, the graph of f intersects the x-axis at the three points $(-4, 0)$, $\left(\frac{1}{2}, 0\right)$, and $(p, 0)$. What is the value of c?

A) -18
B) -2
C) 2
D) 10

each point represents an x & y value that you can substitute into the eq.
using $(-4,0)$:

$0 = 2(-4)^3 + 3(-4)^2 + c(-4) + 8$
$0 = -128 + 48 - 4c + 8$
$0 = -72 - 4c$
$72 = -4c \rightarrow c = -18$

4-6 is on the back

4. A typical image taken of the surface of Mars by a camera is 11.2 gigabits in size. A tracking station on Earth can receive data from the spacecraft at a data rate of 3 megabits per second for a maximum of 11 hours each day. If 1 gigabit equals 1,024 megabits, what is the maximum number of typical images that the tracking station could receive from the camera each day?

gb = gigabits
mb = megabits

$$\frac{3\text{ mb}}{1\text{ sec}} \cdot \frac{60\text{ sec}}{1\text{ min}} \cdot \frac{60\text{ min}}{1\text{ hr}} \cdot \frac{1\text{ gb}}{1024\text{ mb}} = \frac{10.55\text{ gb}}{\text{hr}} \cdot \frac{11\text{ hrs}}{\text{day}}$$

$$10.36 \rightarrow \boxed{10 \text{ images per day}} = \frac{116.05\text{ gb}}{\text{day}} \cdot \frac{1\text{ image}}{11.2\text{ gb}}$$

5. If $-\frac{9}{5} < -3t + 1 < -\frac{7}{4}$, what is one possible value of $9t - 3$?

$9t-3$ is $-3t+1$ multiplied by -3

$$-3\left(-\frac{9}{5}\right) < -3(-3t+1) < -3\left(-\frac{7}{4}\right)$$

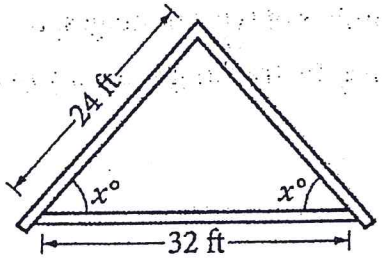
$$+\frac{27}{5} > 9t-3 > +\frac{21}{4} \rightarrow$$

$5.4 > 9t-3 > 5.25$ (less than 5.4 and greater than 5.25)

answer is any # between $\frac{27}{5}$ & $\frac{21}{4}$

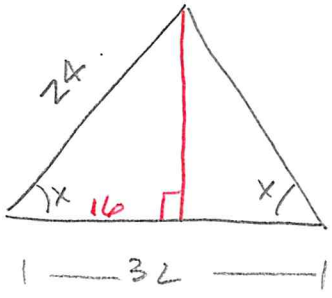
$5.4 < \quad < 5.25$

6. An architect drew the sketch below while designing a house roof. The dimensions shown are for the interior of the triangle.



Note: Figure not drawn to scale.

What is the value of cos x?



THIS IS an isosceles △

$$\cos x = \frac{\text{ADJ}}{\text{HYP}} = \frac{16}{24}$$

$$= \frac{2}{3}$$