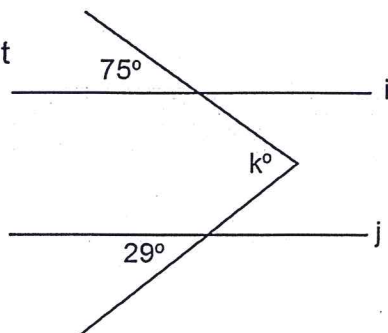


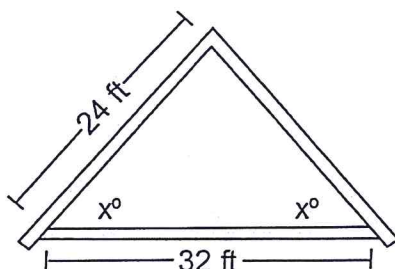
1. In the figure at the right line i is parallel to line j . What is the value of k ?

Note: Figure not drawn to scale.



2. An architect drew the at the right while designing a roof. The dimensions shown are for the interior of the triangle.

What is the value of $\cos X$?



Note: Figure not drawn to scale.

3. 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% 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?

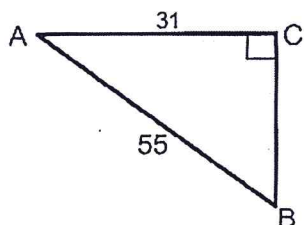
A. $50,000(0.1)^{20t}$ B. $50,000(0.1)^{\frac{t}{20}}$ C. $50,000(0.9)^{20t}$ D. $50,000(0.9)^{\frac{t}{20}}$

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

6. Find the measure of Angle A to the nearest tenth of a degree

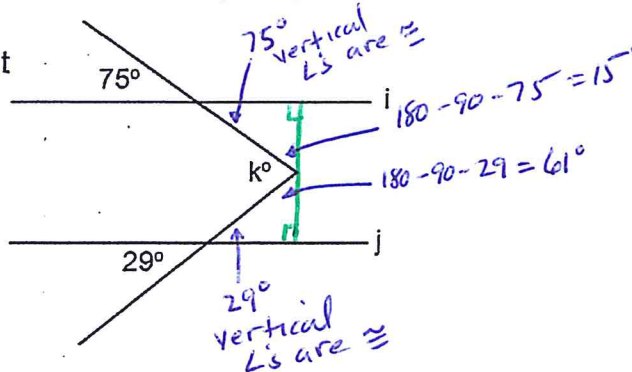


Note: Figure not drawn to scale.

ANSWERS

1. In the figure at the right line i is parallel to line j . What is the value of k ?

Note: Figure not drawn to scale.

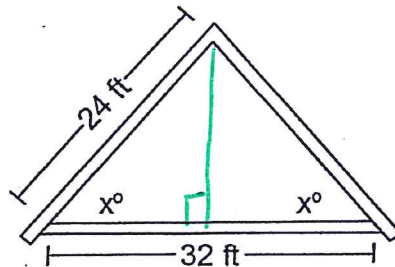


$$k + 15 + 61 = 180$$

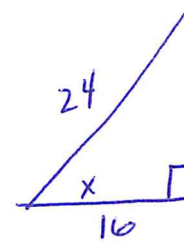
$$k = 104^\circ$$

2. An architect drew the at the right while designing a roof. The dimensions shown are for the interior of the triangle.

What is the value of $\cos X$?



Note: Figure not drawn to scale.



$$\cos X = \frac{\text{ADJ LEG}}{\text{HYP}}$$

$$\cos X = \frac{16}{24} = \frac{2}{3}$$

3. 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% 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. $50,000(0.9)^{\frac{t}{20}}$

$$y = a \cdot b^x$$

Handwritten notes: $a = 50,000$, $b = 100\% - 10\% = 90\% \rightarrow 0.9$, $x = \# \text{ 20 yr periods} = \frac{t}{20}$

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

$$x + y + z = 855$$

$$x = 1.5(y + z)$$

$$x = \frac{3}{2}(y + z)$$

$$\frac{2}{3}x = y + z$$

$$x + \frac{2}{3}x = 855$$

$$\frac{5}{3}x = 855$$

$$x = 855 \cdot \frac{3}{5}$$

$$x = 513$$

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

Handwritten note: $x + 32 = 24$

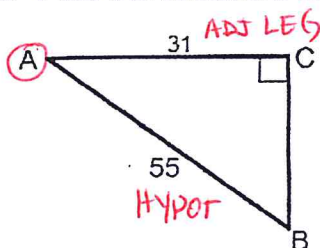
Handwritten note: multiply all parts by -3

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

$$5.4 > 9t - 3 > 5.25$$

Handwritten note: ANY # between 5.25 & 5.4

6. Find the measure of Angle A to the nearest tenth of a degree



$$\cos A = \frac{31}{55}$$

$$\angle A = \cos^{-1}\left(\frac{31}{55}\right) = 55.6923$$

$$\angle A = 55.7^\circ$$

Note: Figure not drawn to scale.