

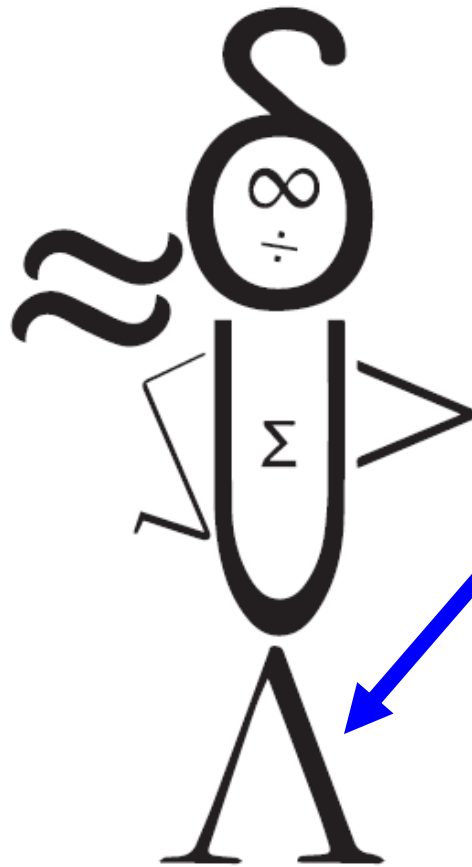
**2018**

**Calhoun Community College  
Mathematics Tournament**

**CIPHERING**

# PRACTICE Question 1

Write the name of the Greek letter shown [here](#) on the “The Significant Figure”.



# Answer to PRACTICE Question 1

**LAMBDA**

# PRACTICE Question 2

Buddy the elf can make 1000 paper snowflakes in 5 hours.

You can complete the same task in 5 days.

How long, in hours, would it take to make 1000 paper snowflakes if Buddy and you worked together at the same time?

Answer must be in exact decimal form.

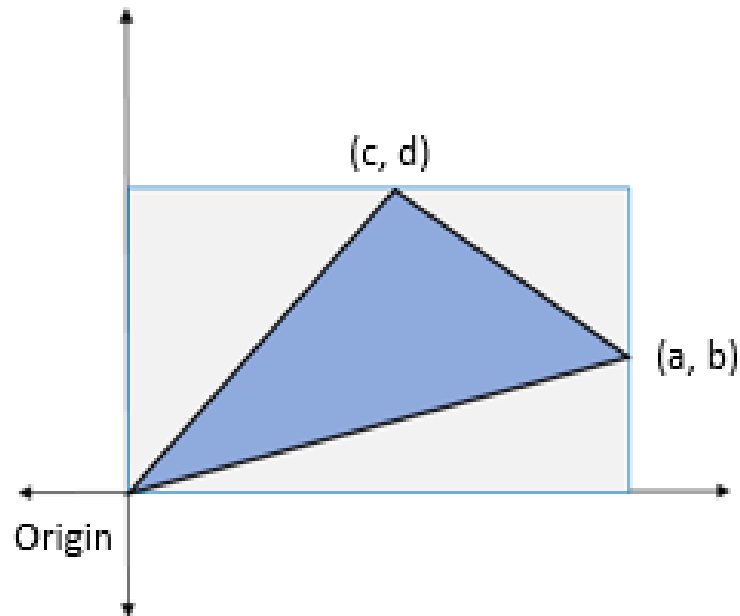
# Answer to PRACTICE Question 2

4.8 hours



# Question 1

Find the area of a triangle with one vertex at the origin and the other two vertices at  $(a, b)$  and  $(c, d)$  as shown in the figure below. Variables  $a$ ,  $b$ ,  $c$ , and  $d$  represent positive numbers.



# Answer to Question 1

$$\frac{1}{2}(ad - bc) \quad \text{or} \quad \frac{1}{2}ad - \frac{1}{2}bc$$

## Question 2

Find an equation of the line  
in slope-intercept form  
that passes through  
the points of intersection of  
 $y = x^2$  and  $y = 12x - x^2$ .



# Answer to Question 2

$$y = 6x$$

# Question 3

If  $\log_a x = 8$ ,  $\log_a y = 6$ , and  $\log_a z = 4$ , evaluate:

$$\log_a \frac{\sqrt[4]{y^2 z^5}}{\sqrt[8]{\frac{x^6}{z^4}}}$$

# Answer to Question 3

4

## Question 4

A theater has 28 rows with 24 seats in the first row, 27 seats in the second row, 30 in the third row, and so forth. How many seats are in the theater?

# Answer to Question 4

1,806

# Question 5

Solve for  $x$  in the interval  $[0, 2\pi)$ .

Answer(s) must be in radians.

$$\tan x - \sec x = 1$$

# Answer to Question 5

*$\pi$*

# Question 6

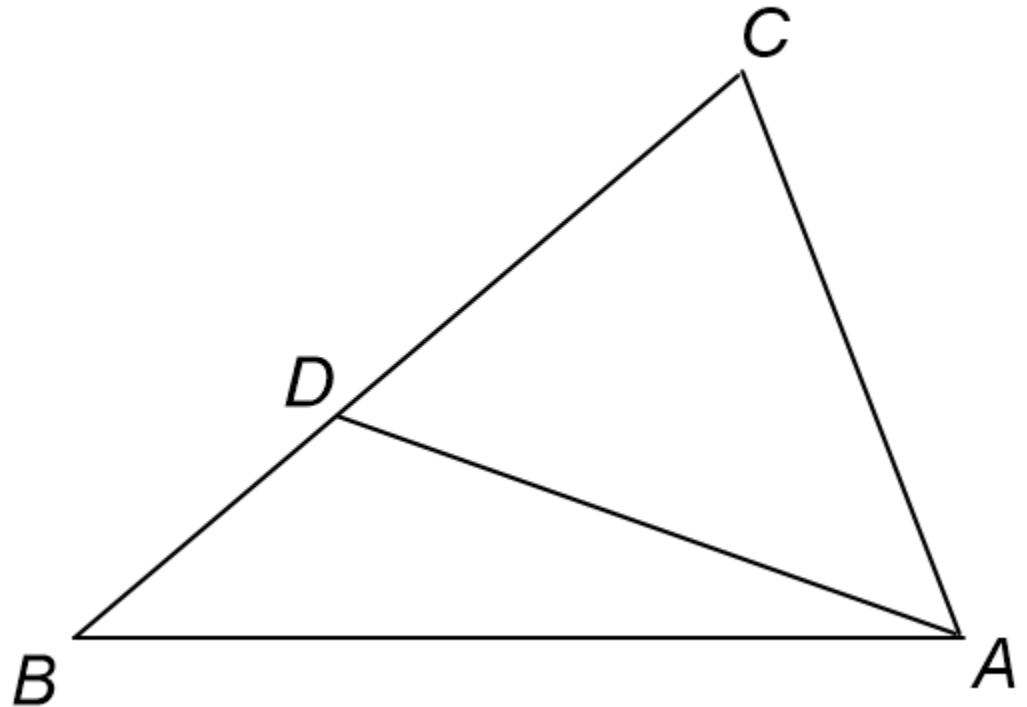
In triangle  $ABC$ ,  $\angle ABC = 45^\circ$ .

Point  $D$  is on  $BC$

so that  $2(BD) = CD$

and  $\angle DAB = 15^\circ$ .

Find  $\angle ACB$ .





# Answer to Question 6

$75^\circ$

# Question 7

Evaluate the limit.

Simplify your answer completely.

$$\lim_{x \rightarrow \infty} \left[ 7x \sin \left( \frac{8}{x} \right) \right]$$

# Answer to Question 7

56

## Question 8

For what real value of  $x$  is

$$\frac{3^{x/4} \sqrt{3}}{(3^4)^5} = \frac{1}{81} \quad \text{true?}$$

# Answer to Question 8

62

# Question 9

Given that two nonnegative numbers have a sum of 9 and the product of one number and the square of the other number is a maximum, find this maximum value.

# Answer to Question 9

108

# Question 10

On the table there are eleven candy canes of various sizes.

There are three small ones that cost \$0.50 each,

four large ones that cost \$1 each, and

four jumbo ones that cost \$2 each.

How many ways can three candy canes be selected

from the eleven candy canes

so that the total cost is more than \$4?



# Answer to Question 10

46