

A table of formulas can be found on page 6.

The point value of each problem is indicated. To obtain full credit for a problem you must have the correct answers along with **supporting work** to justify them. **Partial credit** will be given based on the work that is shown. However, answers without supporting work will receive **no credit**.

1. A circular sector has central angle =  $67^\circ$  and arc length  $s = 8.3$  feet.

- a) (8 pts.) Find  $r$ , the radius of the circular sector, rounded to three decimal places.

8

$$s = 8.3 \text{ feet} = 2\pi r \cdot \frac{67}{360}$$

$$r = 8.3 \times \frac{1}{2\pi} \times \frac{360}{67} = 7.69783 = 7.098 \text{ feet}$$

ANSWER: \_\_\_\_\_

- b) (8 pts.) Find the area (in square feet) of the circular sector, rounded to three decimal places.

8

$$A = \pi r^2 \cdot \frac{\pi^\circ}{360}$$

$$A = \frac{1}{2} r^2 \theta$$

$$A = \pi \cdot 7.098^2 \cdot \frac{67}{360} = 29.45738322$$

$$= 29.457 \text{ square feet}$$

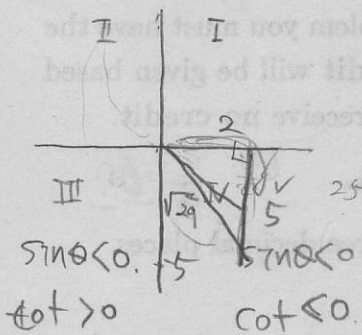
ANSWER: \_\_\_\_\_

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2. (20 pts.) Suppose that  $\cot \theta = -\frac{2}{5}$ ,  $\sin \theta < 0$ .

Determine which quadrant  $\theta$  lies in and compute the exact values of the remaining trigonometric functions of  $\theta$ , that is,  $\cos \theta$ ,  $\sin \theta$ ,  $\tan \theta$ ,  $\sec \theta$  and  $\csc \theta$ . (Note: Calculator approximations will receive no credit.)

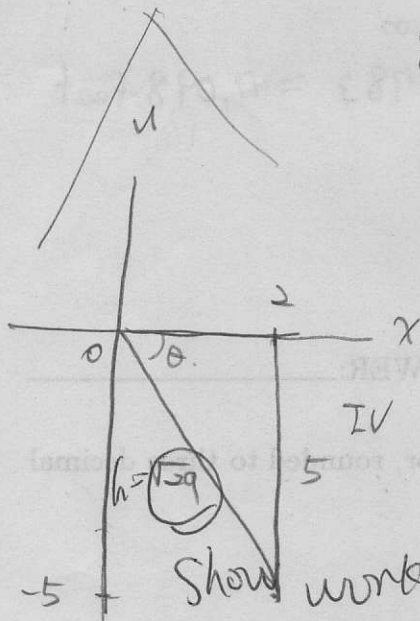
quadrant  $\theta$  lies in quadrant IV



$\cot \theta = -\frac{2}{5}$      $\tan \theta = -\frac{5}{2}$

$\sin \theta = -\frac{5}{\sqrt{29}}$      $\cos \theta = +\frac{2}{\sqrt{29}}$      $\tan \theta = -\frac{5}{2}$

$\csc \theta = -\frac{\sqrt{29}}{5}$      $\sec \theta = \frac{\sqrt{29}}{2}$



$h^2 = 2^2 + 5^2$   
 $r^2 = 29$   
 $h = \sqrt{29}$

17 (13)

ANSWER: \_\_\_\_\_