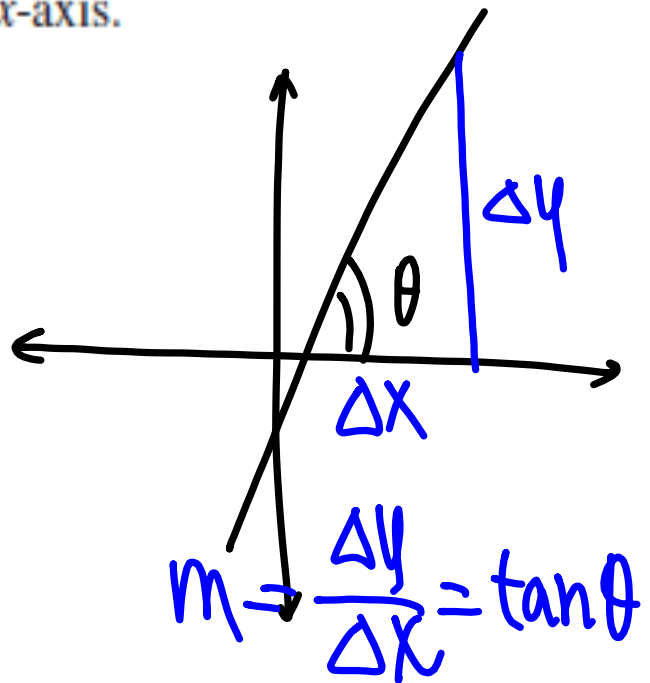


43. Find the acute angle that is formed by the line  $y - \sqrt{3}x + 1 = 0$  and the  $x$ -axis.

$$y = \sqrt{3}x - 1$$

$$\tan \theta = m$$

$$\begin{aligned}\theta &= \tan^{-1} \sqrt{3} \\ &= \frac{\pi}{3}\end{aligned}$$



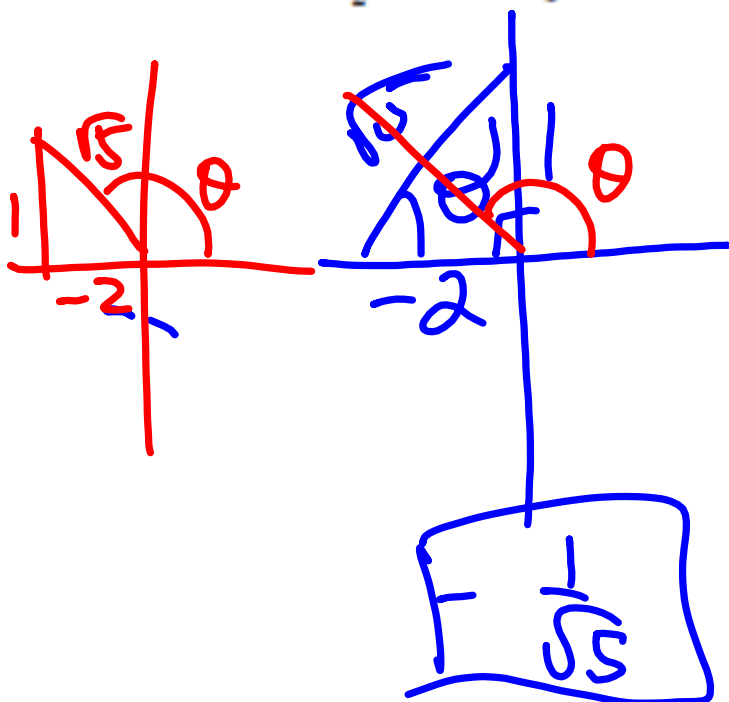
$$\begin{aligned} 33. \cot\left(-\frac{22\pi}{3}\right) &= \cot\left(-\frac{22\pi}{3} + \frac{24\pi}{3}\right) \\ &= \cot\left(\frac{2\pi}{3}\right) \\ &= \frac{1}{\tan\frac{2\pi}{3}} = \frac{1}{-\sqrt{3}} = -\frac{\sqrt{3}}{3} \end{aligned}$$

67. Find the area of a triangle with sides of length 8 and 14 and included angle  $35^\circ$ .

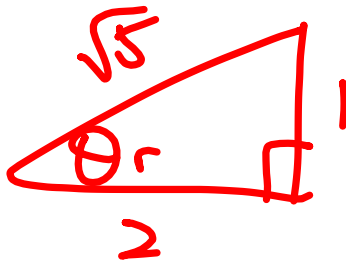
$$A = \frac{1}{2} ab \sin C$$

$$= \frac{1}{2} (8)(14) \sin 35^\circ = 32.1$$

53. If  $\tan \theta = -\frac{1}{2}$  for  $\theta$  in quadrant II, find  $\sin \theta + \cos \theta$ .

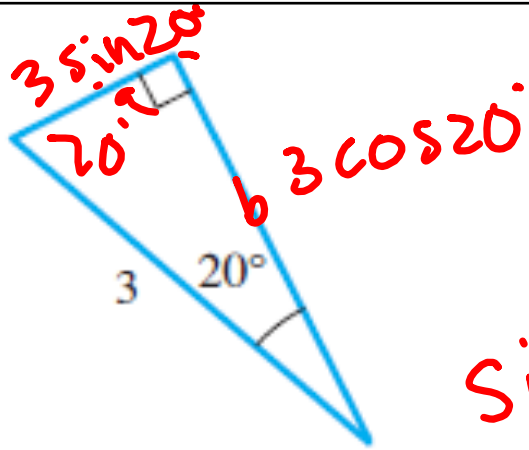


53. If  $\tan \theta = -\frac{1}{2}$  for  $\theta$  in quadrant II, find  $\sin \theta + \cos \theta$ .



$$\frac{1}{\sqrt{5}} - \frac{2}{\sqrt{5}} = -\frac{1}{\sqrt{5}}$$

21.



$$\sin 20^\circ = \frac{a}{3}$$

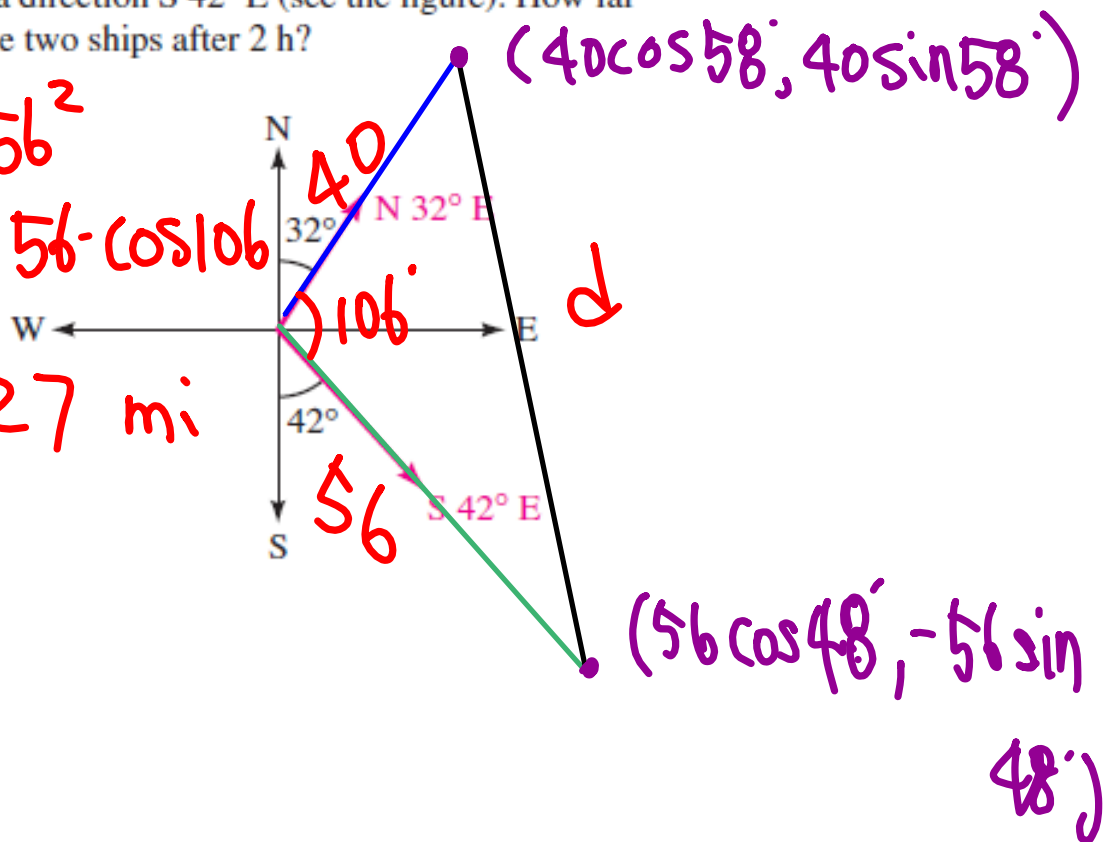
$$3 \sin 20^\circ = a$$

63. Two ships leave a port at the same time. One travels at 20 mi/h in a direction N 32° E, and the other travels at 28 mi/h in a direction S 42° E (see the figure). How far apart are the two ships after 2 h?

$$d^2 = 40^2 + 56^2$$

$$- 2 \cdot 40 \cdot 56 \cdot \cos 106^\circ$$

$$= 77.27 \text{ mi}$$



45.  $\tan \theta$ ,  $\cos \theta$ ;  $\theta$  in quadrant II

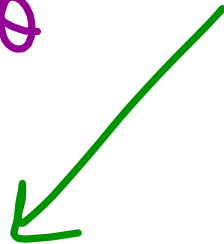
$$\tan \theta < 0$$

$$\cos \theta < 0$$

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$= \frac{\sqrt{1 - \cos^2 \theta}}{\cos \theta}$$

$$\left. \begin{array}{l} \sin \theta \\ = \pm \sqrt{1 - \cos^2 \theta} \end{array} \right\}$$



$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\sin^2 \theta = 1 - \cos^2 \theta$$

$$\sin \theta = \pm \sqrt{1 - \cos^2 \theta}$$



47.  $\tan^2\theta$ ,  $\sin\theta$ ;  $\theta$  in any quadrant

$$\begin{aligned}\tan^2\theta &= \frac{\sin^2\theta}{\cos^2\theta} \\ &= \frac{\sin^2\theta}{1 - \sin^2\theta}\end{aligned}$$

$$\tan^2\theta > 0$$

$$\begin{aligned}\tan^2\theta &= \sec^2\theta - 1 \\ &= \frac{1}{\cos^2\theta} - 1 \\ &= \frac{1}{1 - \sin^2\theta} - 1\end{aligned}$$

45.  $\tan \theta$ ,  ~~$\cos \theta$~~ ;  $\theta$  in quadrant II  
 $\sin \theta$

$$\tan \theta < 0$$
$$\sin \theta > 0$$

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$
$$= \frac{\sin \theta}{-\sqrt{1 - \sin^2 \theta}}$$