Warm up

Find the exact ratio of the following without a calculator:

1. $\sin\frac{2\pi}{3}$ $\sqrt{3}/2$

2. $\tan\frac{\pi}{2}$ und

3. $\sec 225°$ $-\sqrt{2}$

4. $\cot 0$ und

5. $\cos\frac{\pi}{6}$ $\frac{\sqrt{3}}{2}$

6. $\csc\left(-\frac{5\pi}{6}\right)$ -2

7. $\sin 240°$ $-\sqrt{3}/2$

8. $\cot\frac{7\pi}{4}$ $= -1$

$\tan\frac{7\pi}{4} = -1$

9. $\sec\frac{2\pi}{3}$ -2

10. $\tan\frac{7\pi}{6}$ $= +\frac{1}{\sqrt{3}}$

11. $\csc 330°$ -2

12. $\cos(-270°)$ 0

Find the values of θ without a calculator (0 ≤ θ < 2π)

13. $\sin\theta = -\frac{\sqrt{3}}{2}$ Q3, Q4

$60°$ $\frac{\pi}{3}$

14. $\cot\theta = und$

π, 180

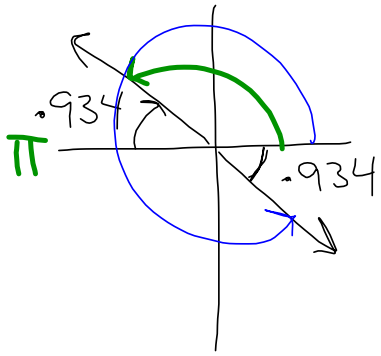
0, $0°$

Find the values of θ using a calculator (0 ≤ θ < 2π)

15. $\tan\theta = -1.3517$

$\tan^{-1}(1.3517)$ Q2, Q4

$\theta = .934$



$\pi - .934$

$2\pi - .934$

4.8 Day 2 Applications and Models

Word Problems

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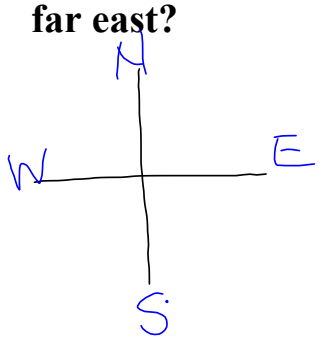
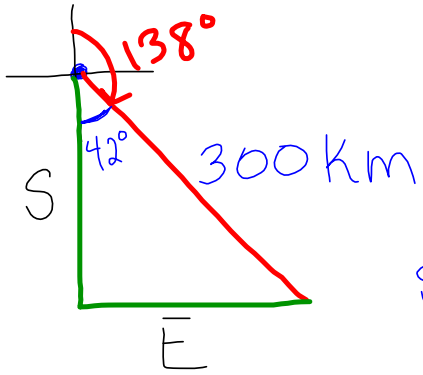
2. An airplane travels at 150km/h for 2 hours in a direction of 138° from Omaha. At the end of this time, how for south of Omaha is the plane? How far east?





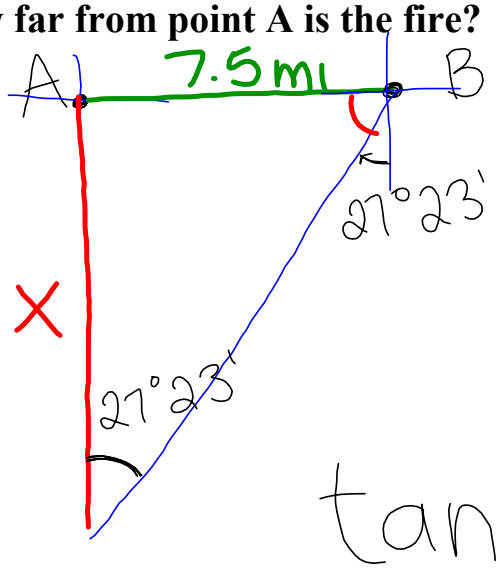
$\sin 42 = \frac{E}{300}$

$\cos 42 = \frac{S}{300}$

S: 222.94 km

E: 200.74 km

3. A forest ranger at a point A sights a fire directly south. A second ranger at a point B, 7.5 miles east, sights the same fire at a bearing of S27°23'W. How far from point A is the fire?



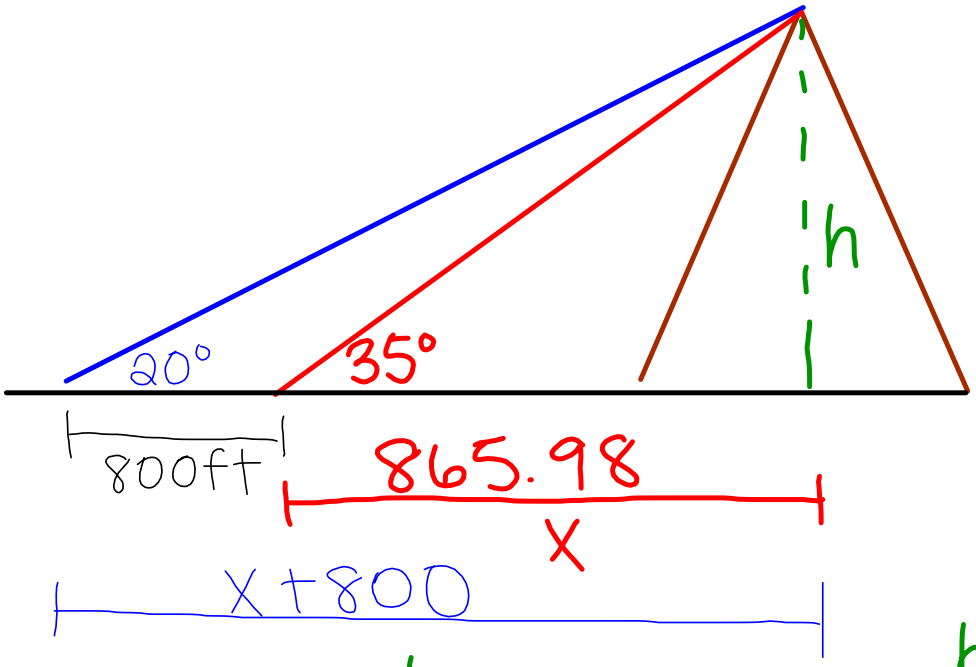
Start @ south & go 27°23' to the west

$$\tan 27°23' = \frac{7.5}{X}$$

$$\frac{7.5}{\tan 27°23'}$$

14.48km

1. While visiting Sand Dunes National Park, Ian approximated the angle of elevation to the top of a sand dune to be 20˚. After walking 800 feet closer, he guessed that the angle of elevation had increased by 15˚. Approximately how tall is the dune he was observing?



$\tan 20° = \frac{h}{x+800}$ $\quad x \cdot \tan 35° = \frac{h}{x} \cdot x$

$\tan 20° = \frac{x \cdot \tan 35°}{x+800}$ $\quad h = x \cdot \tan 35°$

$\frac{.36}{1} = \frac{.7x}{x+800}$

$.7x = .36x + 291.18$

$-.36x \quad -.36x$

$.34x = 291.18$

$x = 865.98$

HOMEWORK

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33, 34, 36, 37, 39,
41, 43