

How many solutions does each of these triangles have?

1. $a=2.53, b=3.76, c=8.04$ ○

SSS

2. $A=15^\circ, a=4, c=11$ 2

ASS

3. $A=72^\circ, b=8.4, c=17.2$ 1

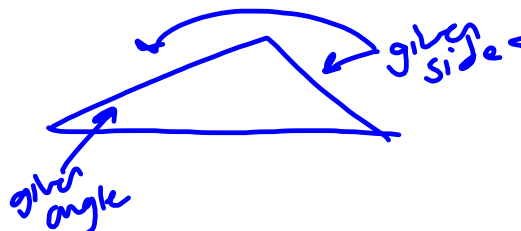
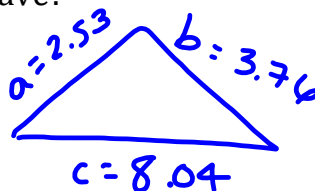
SAS

4. $B=64^\circ, b=2, c=17$ ○

ASS

5. $C=23^\circ, b=4.9, c=9.8$ 1

ASS



Prove the identity: 6.3 #87

$$\tan 2x = \frac{2}{\cot x - \tan x}$$

Solve the equation: 6.6 #74

$$\sin 4x - \cos 2x = 0, \quad 0 \leq x < 2\pi$$

Prove.

$$\tan 2x = \frac{2}{\cot x - \tan x}$$

$$\text{RHS} = \frac{2}{\left(\frac{1}{\tan x} - \tan x\right)} \cdot \frac{\tan x}{\tan x} = \frac{2 \tan x}{1 - \tan^2 x} = \tan 2x = \text{LHS}$$

Solve for x.

$$\sin 4x - \cos 2x = 0, \quad 0 \leq x < 2\pi$$

$$0 \leq 2x < 4\pi$$

$$\sin 2(2x) - \cos 2x = 0$$

$$2 \sin 2x \cos 2x - \cos 2x = 0$$

$$\cos 2x (2 \sin 2x - 1) = 0$$

$$\cos 2x = 0$$

$$; 2 \sin 2x - 1 = 0$$

$$2x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \frac{7\pi}{2}$$

$$\sin 2x = \frac{1}{2}$$

$$2x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{13\pi}{6}, \frac{17\pi}{6}$$

$$x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

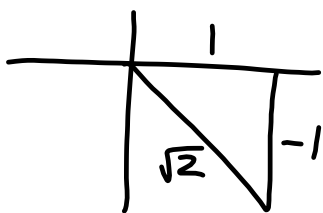
$$x = \frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}$$

$$15. \frac{\sin 2x}{1 - \cos 2x} = \cot x$$

$$\text{LHS} = \frac{2 \sin x \cos x}{1 - (1 - 2 \sin^2 x)} = \frac{\cancel{2} \sin x \cos x}{\cancel{2} \sin x \sin x} = \cot x = \text{RHS}$$

$$a - (b - c) = a - b + c$$

$$12. \tan \frac{7\pi}{8} = \tan \frac{\frac{7\pi}{4}}{2} = \frac{1 - \cos \frac{7\pi}{4}}{\sin \frac{7\pi}{4}}$$



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

$$= \left(1 - \frac{\sqrt{2}}{2}\right) \cdot \left(-\frac{\sqrt{2}}{1}\right)$$

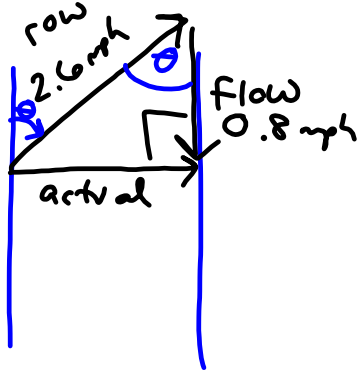
$$= -\sqrt{2} + \frac{2}{2}$$

$$= \boxed{1 - \sqrt{2}}$$

7.3 # 38

can row 2.6 mph in still water
 wants to row due east across river
 river flowing from the north @ 0.8 mph
 what heading is necessary?

angle measured clockwise from North

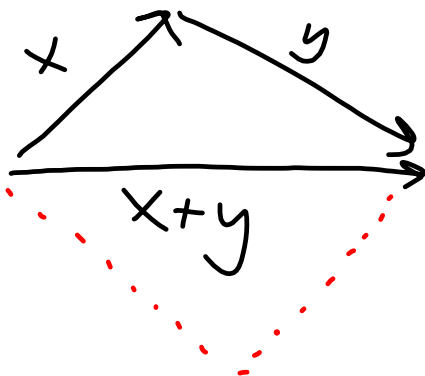


$$\cos \theta = \frac{0.8}{2.6}$$

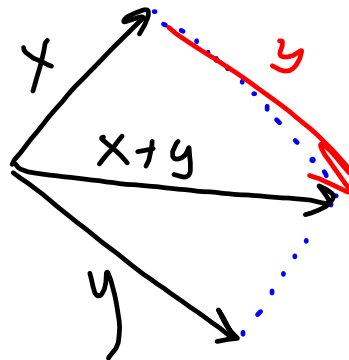
$$\theta = \cos^{-1}\left(\frac{0.8}{2.6}\right) = 72^\circ$$

2 ways to add vectors

triangle method

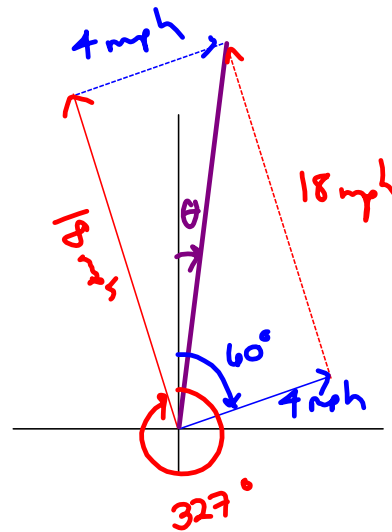
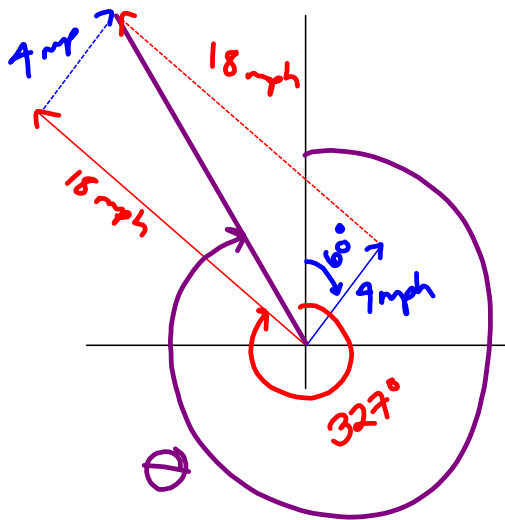


parallelogram method



7.3 #40

boat heading 327° @ 18mph
 current heading 60° @ 4 mph
 course (angle heading) of boat?



Homework #9 (due Fri. 10/17):

- 7.1 #1-21 odd solving triangles with Law of Sines
- 7.1 #29,30,33,34,35 word problems with Law of Sines
- 7.2 #9-19 odd solving triangles with Law of Cosines
- 7.2 #25-29 odd; area
- 7.2 #38,43,46,47,48 word problems with Law of Cosines
- 7.3 #37,41,43 word problems with Law of Sines/Cosines

Homework #10 (due Fri. 10/24)

- 7.3 #1-35 odd vector operations
- 7.3 #45-59 odd dot product and angle between vectors
- 7.4 #1-65 odd trigonometric form of complex numbers

Quiz #7 - Thursday 10/16 *Law of Sines/Cosines*

Test #4 - ~~next week?~~
Wed, 10/22

