

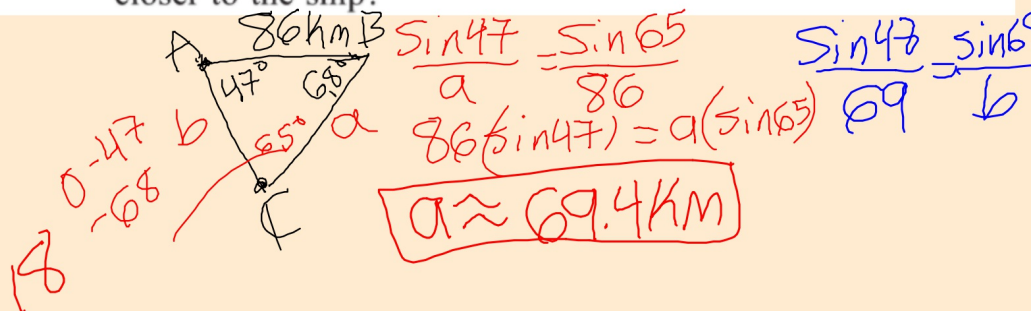
Welcome Back MYP Math 9!

Reflect on last night's exercises.

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: <u>11/27</u> Topic: <u>13F Bearings & Trigonometry</u>	0 1 2	
Tuesday Date: <u>11/28</u> Topic: <u>Review Set A/B Trigonometry Applications</u>	0 1 2	
Wednesday Date: <u>11/29</u> Topic: <u>25B: Law of Sines Area</u>	0 1 2	
Thursday Date: <u>11/30</u> Topic: <u>25C: Law of Sines</u>	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Warm-up:

- 2 A and B are radar stations 86 km apart along the coast. A ship located at point C is in distress. Radar station A records angle CAB as 47° , while radar station B records angle CBA as 68° .
- Draw a reasonably accurate diagram of the situation, showing all the given information.
 - Rescue squads are located at A and B. By how much is B closer to the ship?

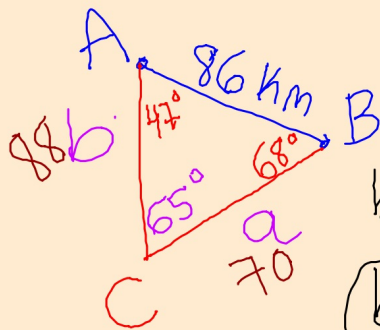


Warm-up:

- 2 A and B are radar stations 86 km apart along the coast. A ship located at point C is in distress. Radar station A records angle CAB as 47° , while radar station B records angle CBA as 68° .
- Draw a reasonably accurate diagram of the situation, showing all the given information.
 - Rescue squads are located at A and B. By how much is B closer to the ship?

$$m\angle C = 65^\circ$$

B is closer by about 18 km



$$\frac{\sin 68^\circ}{b} = \frac{\sin 65^\circ}{86} \quad \frac{\sin 47^\circ}{a} = \frac{\sin 65^\circ}{86}$$

$$b = \frac{86(\sin 68^\circ)}{\sin 65^\circ} \quad a = \frac{86(\sin 47^\circ)}{\sin 65^\circ}$$

$$b \approx 88 \text{ km}$$

$$a \approx 70 \text{ km}$$

Class Plan: Happy Thursday!

1) Warm-up

2) Review for Quiz 3.2 Trigonometry

Chapter 13: Right Triangle Trigonometry

Sections A, B, C, D, E, F

Chapter 25: Non Right Triangle Trig.

Section B, C

3) Message from Mr. Ehlke



Trigonometry Quiz 3.2

Chapter 13: Right Triangle Trigonometry

13B Trig Ratios

13C Sides

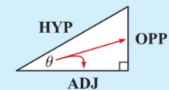
13D Angles

13E Applications with Trigonometry

13F Bearings

In any right angled triangle with one angle θ , we have:

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}, \quad \cos \theta = \frac{\text{ADJ}}{\text{HYP}}, \quad \tan \theta = \frac{\text{OPP}}{\text{ADJ}}$$



Chapter 25: Non Right Triangle Trig.

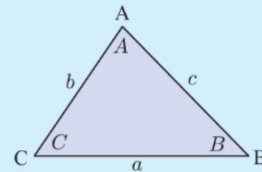
25B Area of a Triangle

25C The Sine Rule

$$\text{area} = \frac{1}{2}ab \sin C$$

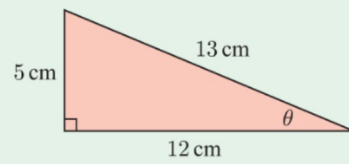
In any triangle ABC with sides a , b , and c units, and opposite angles A , B , and C respectively,

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \quad \text{or} \quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$



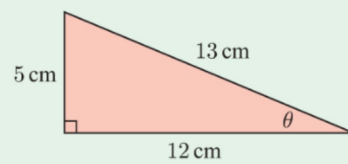
Review 13B Right Triangle Trig Ratios

- 3 Find $\sin \theta$, $\cos \theta$, and $\tan \theta$ for the given triangle.



Review 13B Right Triangle Trig Ratios

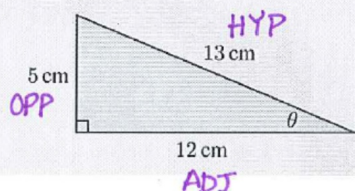
- 3 Find $\sin \theta$, $\cos \theta$, and $\tan \theta$ for the given triangle.



13B Right Triangle Trigonometric Ratios

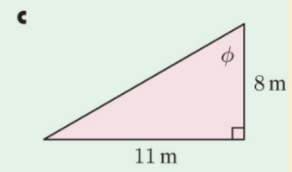
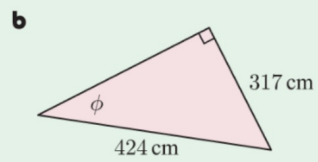
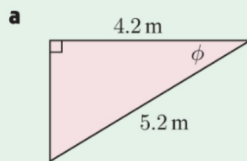
- 3 Find $\sin \theta$, $\cos \theta$, and $\tan \theta$ for the given triangle.

$$\sin \theta = \frac{5}{13} \quad \cos \theta = \frac{12}{13} \quad \tan \theta = \frac{5}{12}$$



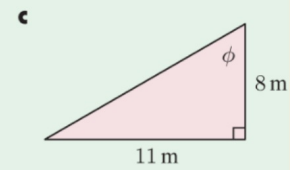
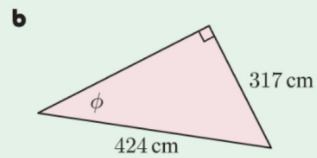
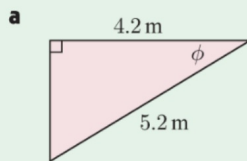
Review 13D Solving for Angles

5 Find the value of ϕ :



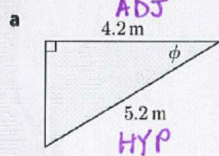
Review 13D Solving for Angles

5 Find the value of ϕ :



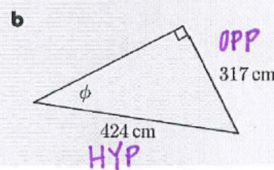
13D Solving for Angles

5 Find the value of ϕ :



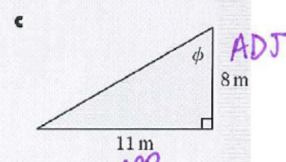
$$\phi = \cos^{-1}\left(\frac{4.2}{5.2}\right)$$

$$\boxed{\phi \approx 36^\circ}$$



$$\phi = \sin^{-1}\left(\frac{317}{424}\right)$$

$$\boxed{\phi \approx 48^\circ}$$

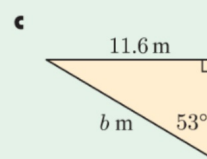
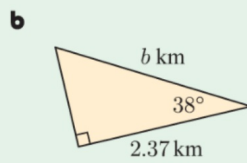
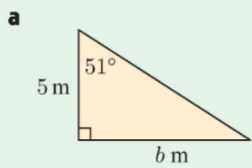


$$\phi = \tan^{-1}\left(\frac{11}{8}\right)$$

$$\boxed{\phi \approx 54^\circ}$$

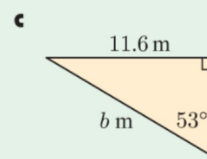
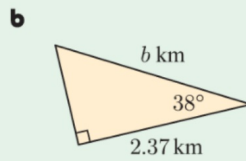
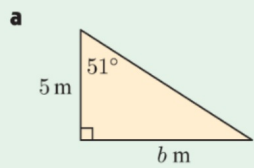
Review 13C Solving for Sides

6 Find the value of b :

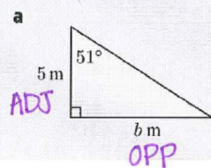


Review 13C Solving for Sides

6 Find the value of b :



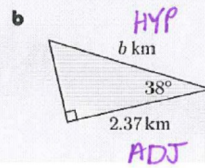
6 Find the value of b :



$$\tan 51^\circ = \frac{b}{5}$$

$$b = 5 \cdot \tan 51^\circ$$

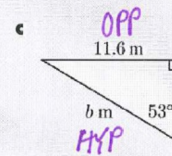
$$\boxed{b \approx 6.2 \text{ m}}$$



$$\cos 38^\circ = \frac{2.37}{b}$$

$$\frac{2.37}{\cos 38^\circ} = \frac{b \cdot \cos 38^\circ}{\cos 38^\circ}$$

$$\boxed{3.0 \approx b}$$



$$\sin 53^\circ = \frac{11.6}{b}$$

$$\frac{11.6}{\sin 53^\circ} = \frac{b \cdot \sin 53^\circ}{\sin 53^\circ}$$

$$\boxed{14.5 \approx b}$$

Review 13E Applications with Trigonometry

**(Review Set A/B WS
from Monday)**

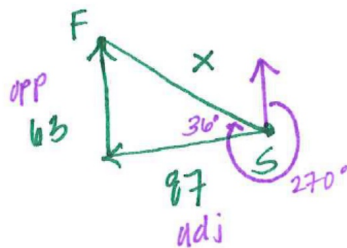
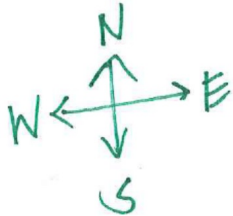
Review 13F Bearings

- 12** A motorcyclist travels 87 km west and then 63 km north.
- a** How far is she from her starting point?
 - b** What is her bearing from her starting point?

Review 13F Bearings

- 12 A motorcyclist travels 87 km west and then 63 km north.
- How far is she from her starting point?
 - What is her bearing from her starting point?

12. 87 km west, 63 km north



$$\tan^{-1}\left(\frac{63}{87}\right) = \theta$$
$$36^\circ \approx \theta$$

$$36 + 270$$

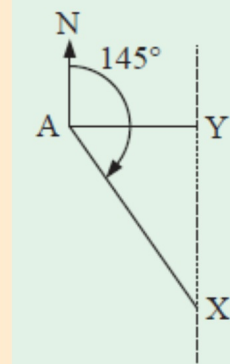
$$\approx 306^\circ$$

$$x = \sqrt{63^2 + 87^2}$$

$$x \approx 107 \text{ km}$$

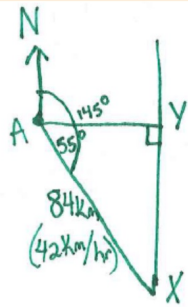
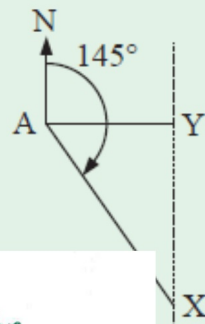
Two cyclists depart from A at the same time. X cycles in a direction 145° for two hours at a speed of 42 km per hour. Y cycles due East and at the end of the two hours is directly North of X.

- a** How far did X travel in 2 hours?
- b** How far did Y travel in 2 hours?
- c** Determine the average speed at which Y has travelled.



Two cyclists depart from A at the same time. X cycles in a direction 145° for two hours at a speed of 42 km per hour. Y cycles due East and at the end of the two hours is directly North of X.

- How far did X travel in 2 hours?
- How far did Y travel in 2 hours?
- Determine the average speed at which Y has travelled.



a) X travels 42 km in 1 hr.
- in 2 hrs, X distance is 84 km

b) Y is directly below X after 2 hours of traveling.



$$\cos 55 = \frac{D}{84}$$

$$D = 84 \cos 55$$

$$\text{Distance} \approx \boxed{48.2 \text{ km East}}$$

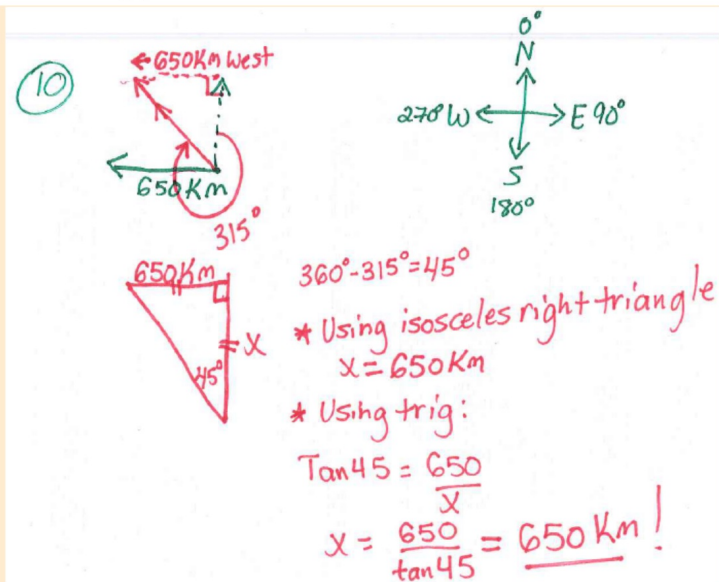
c) 2 hrs: 48.2 km
1 hr: about 24.1 km
Speed $\approx 24.1 \text{ km/hr}$

Review 13F Bearings

- 10** An aeroplane travels on the bearing 315° until it is 650 km west of its starting point. How far north is it from its starting point?

Review 13F Bearings

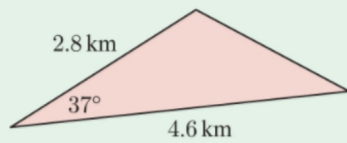
- 10 An aeroplane travels on the bearing 315° until it is 650 km west of its starting point. How far north is it from its starting point?



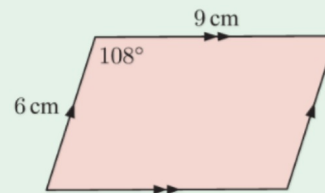
Review 25B Area of a Triangle

3 Find the area of each given figure:

a



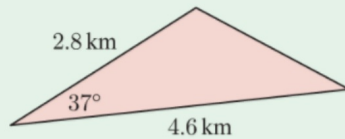
b



Review 25B Area of a Triangle

3 Find the area of each given figure:

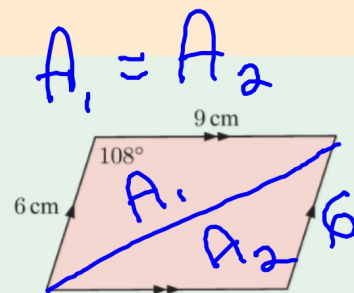
a



$$A = \frac{1}{2}(2.8)(4.6)\sin 37$$

$$A \approx 3.88 \text{ km}^2$$

b



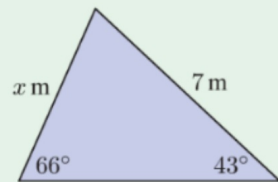
$$A_1 = \frac{1}{2}(6)(9)\sin(108)$$

$$A_1 \approx 25.7 \text{ cm}^2$$

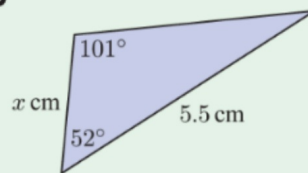
Review 25C The Sine Rule

4 Find the value of x :

a



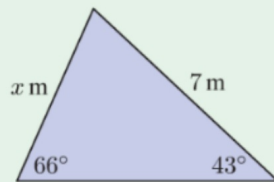
b



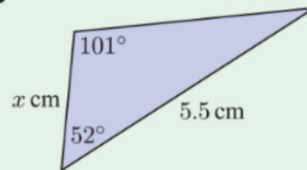
Review 25C The Sine Rule

4 Find the value of x :

a

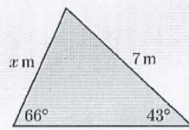


b



4 Find the value of x :

a

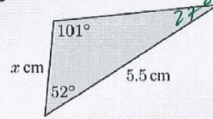


$$\frac{\sin(43^\circ)}{x} = \frac{\sin(66^\circ)}{7}$$

$$\frac{\sin(43^\circ) \cdot 7}{\sin(66^\circ)} = \frac{\sin(66^\circ) \cdot x}{\sin(66^\circ)}$$

$$x \approx 5.23 \text{ m}$$

b



the flagpole is approximately 8.2 m tall.

$$101 + 52 = 153$$

$$180 - 153 = 27^\circ$$

$$\frac{\sin(27^\circ)}{x} = \frac{\sin(101^\circ)}{5.5}$$

$$\frac{\sin(27^\circ) \cdot 5.5}{\sin(101^\circ)} = \frac{\sin(101^\circ) \cdot x}{\sin(101^\circ)}$$

$$x \approx 5.46 \text{ cm}$$

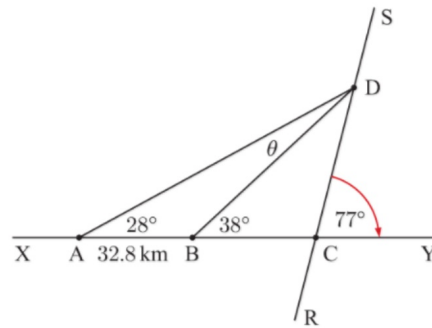
Review 25C The Sine Rule

- 6 [XY] and [RS] are roads which intersect at C at an angle of 77° . There is an explosion at a factory at point D on [RS].

Observers at A and B note that \widehat{CAD} and \widehat{CBD} are 28° and 38° respectively.

A and B are 32.8 km apart.

- Find θ .
- Find the distance [BD].
- How far is D from the intersection C?

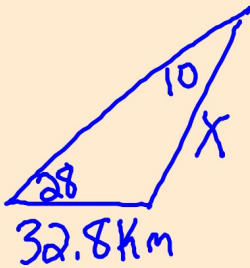
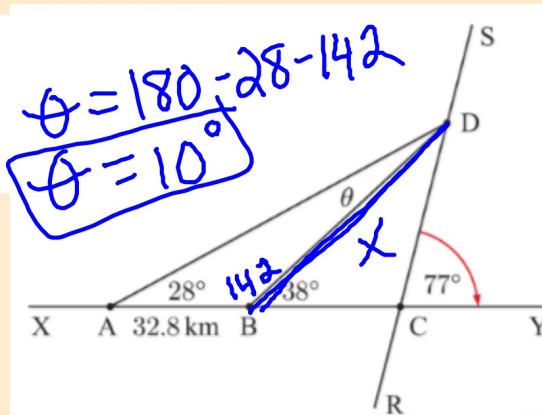


Review 25C The Sine Rule

6 [XY] and [RS] are roads which intersect at C at an angle of 77° . There is an explosion at a factory at point D on [RS].

Observers at A and B note that \widehat{CAD} and \widehat{CBD} are 28° and 38° respectively. A and B are 32.8 km apart.

- Find θ .
- Find the distance [BD].
- How far is D from the intersection C?



$$\frac{\sin 10}{32.8} = \frac{\sin 28}{x}$$

$$x = \frac{32.8(\sin 28)}{\sin 10}$$

$$x \approx 88.7 \text{ km}$$

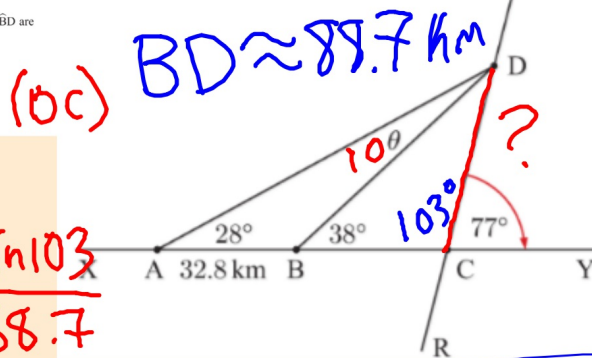
Review 25C The Sine Rule

6 [XY] and [RS] are roads which intersect at C at an angle of 77° . There is an explosion at a factory at point D on [RS].

Observers at A and B note that \widehat{CAD} and \widehat{CBD} are 28° and 38° respectively.

A and B are 32.8 km apart.

- Find θ .
- Find the distance [BD].
- How far is D from the intersection C?



$$\frac{\sin 38}{X} = \frac{\sin 103}{88.7}$$

$$\frac{X(\sin 103)}{(\sin 103)} = \frac{88.7(\sin 38)}{\sin(103)}$$

$$X \approx 56 \text{ km}$$

Exercises...

Study for Quiz 3.2
(Complete Review WS)