

Trigonometry/Precalculus  
Chapter 6 Review  
Day \_\_\_\_\_

Name \_\_\_\_\_  
Date \_\_\_\_\_  
Block \_\_\_\_\_

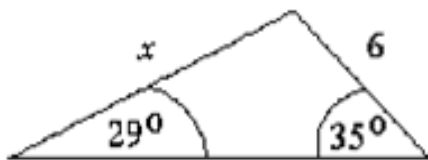
1) Sketch two different triangles such that:  $A = 43^\circ$ ,  $a = 19$ ,  $b = 25$ .



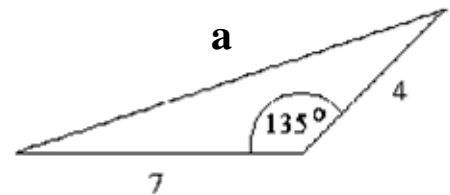
2) Solve the two triangles you sketched in problem 1.

Use the Law of Sines or the Law of Cosines to find the missing sides or angles for the following triangles.

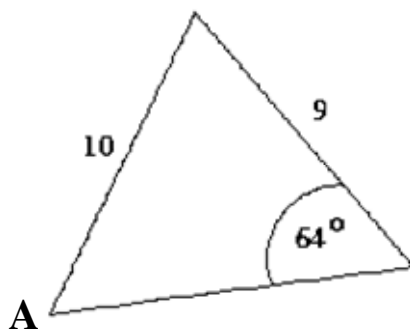
3)



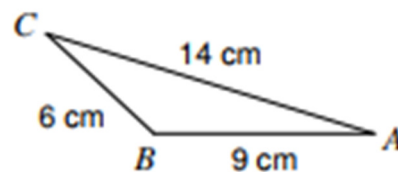
4)



5) angle A =



6) angle C =



7) Two scuba divers are 20m apart below the surface of the water. They both spot a shark that is below them. The angle of depression from diver 1 to the shark is  $47^\circ$  and the angle of depression from diver 2 to the shark is  $40^\circ$ . How far is the first diver from the shark?



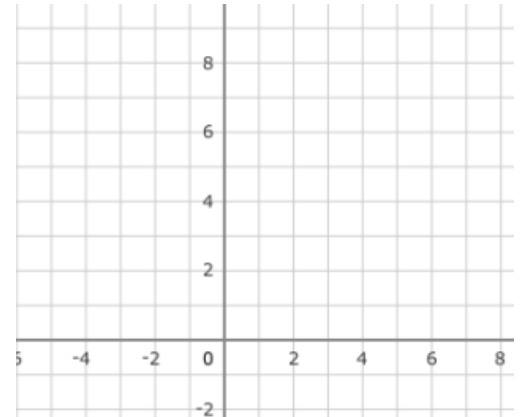
1



2



8) A) Write a vector  $\overrightarrow{GS}$  in component form with initial point  $G(7, 8)$  and  $S(-2, 4)$ . Sketch and label the vector.



B) Find the magnitude of vector  $\overrightarrow{GS}$ .

9) An aircraft carrier travels across the ocean with a bearing of  $140^\circ$  from due North at a speed of 30 mph. Write a vector  $\vec{a}$  that represents the carrier's speed and bearing in **component form**. (a sketch will help)

10) Perform each of the following vector operations:

A)

Given:  $\vec{P} = (-4, 3)$   $\vec{Q} = (6, -9)$

Find:  $9\vec{PQ}$

B)

$\vec{a} = \langle -3, -12 \rangle$

$\vec{b} = \langle 4, 9 \rangle$

Find:  $-3\vec{a} + 7\vec{b}$

C)  $\vec{m} - \vec{n}$

$\vec{m} = \langle -7, 1 \rangle$   $\vec{n} = \langle 12, -16 \rangle$



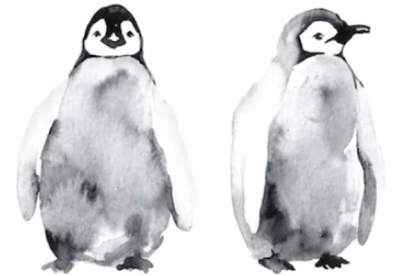
**11)** Determine whether the following vectors are either orthogonal, parallel, or neither. If they are neither, find the measure of the angle between the vectors.

- A)  $\vec{a} \langle -7, -9 \rangle$   $\vec{b} \langle 8, 4 \rangle$       B)  $\vec{k} \langle -3, 4 \rangle$   $\vec{h} \langle 12, -16 \rangle$       C)

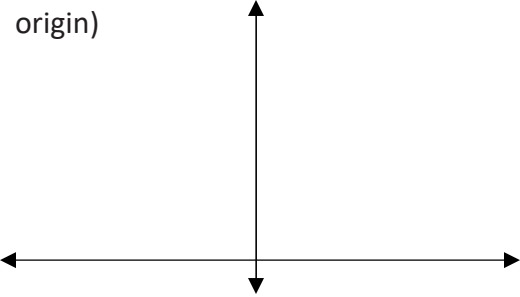
$$\vec{u} = -5\vec{i} - 2\vec{j}$$

$$\vec{v} = -10\vec{i} + 25\vec{j}$$

**12)** Find the angle  $\theta$  between  $u = \langle -4, -3 \rangle$  and  $v = \langle -1, 5 \rangle$ .



**13)** Farmer Larry and his daughter Gloria need to free a one of their cows stuck in deep mud with ropes attached at the same point. Larry pulls at an angle of  $50^\circ$  (in standard position) with a force of 600N. Gloria pulls with a force of 500N at a standard angle of  $120^\circ$ .

<p>a) Draw a diagram that shows the two forces being exerted on the cow. (from the origin)</p> 	<p>b) Write the force vectors in <b>component form</b>, then find <b>the sum of the vectors</b>.</p>
<p>c) What is the magnitude of the combined forces on the cow?</p>	<p>d) What is the direction of the resulting force? (in standard form)</p>

**14)** A plane on a course with a bearing of  $50^\circ$  (from due North) is flying at 400 miles per hour. A 35 mile per hour wind is blowing south.

a) Sketch and label the vectors.

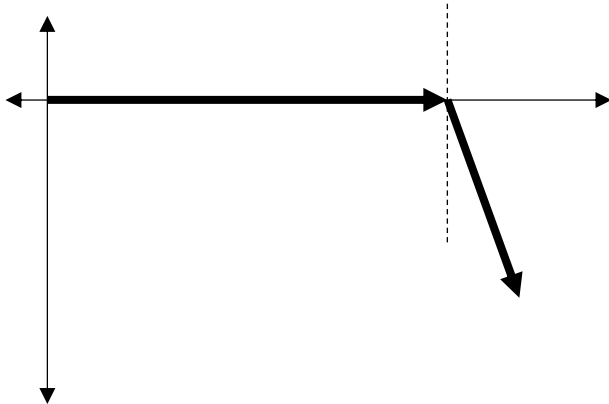
b) What is the resultant bearing of the plane?

c) What is the resultant speed of the plane?

**15)** A ship leaves a port heading east for 90 miles, then turns and heads in a direction of  $S 25^\circ E$  for 50 miles more. A helicopter, leaving from the same port, needs to join the ship as quickly as possible.

a) Label the diagram below with angles and distances.

b) How far does the helicopter have to travel to reach the ship?



c) In which direction should the helicopter head to reach the ship?