

**Review for Test 6.1 – 6.3**

Solve each triangle. Make sure to be on the lookout for triangles that are not possible or cases where two triangles are possible.

1)  $c = 26$ ,  $\angle B = 49^\circ$ , and  $\angle C = 53^\circ$        $A =$  \_\_\_\_\_,  $a =$  \_\_\_\_\_,  $b =$  \_\_\_\_\_

2)  $\angle C = 58^\circ$ ,  $a = 12$  and  $b = 16$        $c =$  \_\_\_\_\_,  $A =$  \_\_\_\_\_,  $B =$  \_\_\_\_\_

3)  $a = 25$ ,  $b = 33$ , and  $c = 28$        $A =$  \_\_\_\_\_,  $B =$  \_\_\_\_\_,  $C =$  \_\_\_\_\_

4)  $\angle A = 60^\circ$ ,  $a = 9$ ,  $c = 10$        $B =$  \_\_\_\_\_,  $C =$  \_\_\_\_\_,  $b =$  \_\_\_\_\_

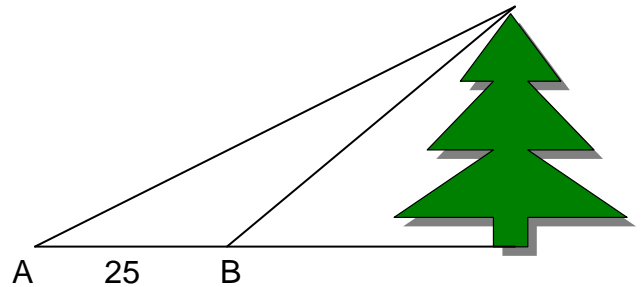
5) Find the area of the triangle where  $b = 24$ ,  $c = 18$  and  $\angle A = 48^\circ$ .

6) Find the area of the triangle with sides of 4ft, 7ft and 10ft.

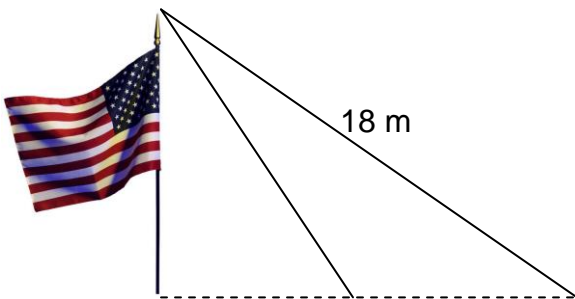
7) A triangular parcel of land has sides of 541 feet, 429 feet, and 395 feet. What is the measure of the smallest angle?

8) Parallelogram ABCD has the following measurements:  $AB = 31$ ,  $BC = 28$ , and  $\angle A = 87^\circ$ . Find the length of the two diagonals  $BD$  and  $AC$ .

9) From a point A, the angle of elevation to the top of a tree is  $38^\circ$ . From a point B 25 feet closer to the tree, the angle of elevation to the top of the tree is  $48^\circ$ . How far is it from point B to the top of the tree?



10) A flagpole is being braced from the top with a wire that is 18 m long with an angle of elevation of  $28^\circ$ . For added support a new wire will be placed from the top closer to the base of the pole. How much wire will be needed for this new support if the angle of elevation is  $40^\circ$ ?



11) The magnitude of  $v = 3$  and the angle for vector  $v$  that it makes with the positive x-axis is  $135^\circ$ . Draw a picture of this and write the vector in  $ai + bj$  form.

12) After leaving an airport, a plane flies for 1.5 hours at a speed of 200 km/h on a course of  $200^\circ$ . Then, on a course of  $340^\circ$ , the plane flies for 2 hours at a speed of 250 km/h. At this time, how far from the airport is the plane?

13) Find the component form of the vector that has initial point C and terminal point D. Then find the magnitude of  $\overrightarrow{CD}$ .

a) C (2,3) D (7,15)

b) C (-2,8) D (4,12)

$\overrightarrow{CD}$  \_\_\_\_\_

$\overrightarrow{CD}$  \_\_\_\_\_

$\|\overrightarrow{CD}\| =$  \_\_\_\_\_

$\|\overrightarrow{CD}\| =$  \_\_\_\_\_

14) Find a component vector to represent  $\mathbf{u}$  in each equation if  $\mathbf{v} = \langle 2, -5 \rangle$  and  $\mathbf{w} = \langle 3, -1 \rangle$ .

a)  $\mathbf{u} = \mathbf{v} + \mathbf{w}$

b)  $\mathbf{u} = \mathbf{v} - \mathbf{w}$

c)  $\mathbf{u} = 2\mathbf{v} - 3\mathbf{w}$

15) A plane flies due west at 250 km/h while the wind blows south at 70 km/h. Find the plane's resultant velocity and direction.

- 16) One force of 100 units acts on an object in a direction due North. Another force of 80 units acts on the object at a bearing of  $40^\circ$  angle from the first force. Find the magnitude and direction of the resultant force on the object.
- 17)  $F_1$  is a force of 5 N pulling an object south and  $F_2$  is a force of 3 N pulling an object in the compass direction of  $40^\circ$ . a) Sketch the resultant vector force and b) find the magnitude and direction of the resultant vector.
- 18) Vector  $\mathbf{v}$  has a magnitude of 1.1 cm and a direction of  $50^\circ$  from the positive x-axis. Find the magnitude of the vertical and horizontal components of this vector. Then write vector  $\mathbf{v}$  in terms of its horizontal and vertical components.
- 19) Let  $\mathbf{u}$  be the vector with initial point  $(-5, 7)$  and terminal point  $(6, -1)$ . Write  $\mathbf{u}$  in component form.
- 20) Let  $\mathbf{u} = 3\sqrt{2}\mathbf{i} + 8\mathbf{j}$  and  $\mathbf{v} = 4\sqrt{2}\mathbf{i} - 5\mathbf{j}$ . Find each of the following.  
a)  $2\mathbf{u} - 3\mathbf{v}$                       b)  $\mathbf{u} + \mathbf{v}$                       c)  $\mathbf{u} - \mathbf{v}$                       d)  $-4\mathbf{v} + \mathbf{u}$
- 21) Find the magnitude of both  $\mathbf{u}$  and  $\mathbf{v}$ .