

My signature on this assessment confirms I have used no outside resources and adhered to all assessment protocols assigned to this quiz.

Accel Precalc

Quiz #17 Name _____

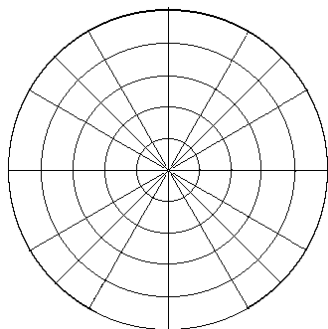
Unit 8: Extended Trig

Lessons: Polar Coordinates, Geometric & Algebraic Vectors, Static Equilibrium and Force Vectors
[100 pts]

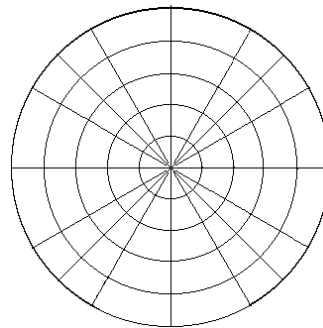
Part 1: Polar Coordinates, Geometric & Algebraic Vectors

- Graph.[3 pts each]

1. $\left(-2, -\frac{2\pi}{3}\right)$



2. $(3, -210^\circ)$



- State rectangular coordinates for the polar coordinates. **Must show the correct work to receive credit for answer.** Give EXACT answer.[5 pts each]

3. $(-6, 120^\circ)$ _____

4. $\left(4, \frac{\pi}{4}\right)$ _____

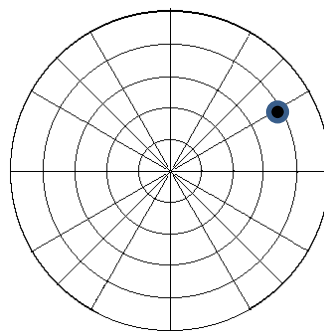
- State polar coordinates for the given pair of rectangular coordinates. Use the interval $r > 0$, rounded to nearest tenth, $0 \leq \theta < 360^\circ$, rounded to nearest whole degree. **You must show the correct work to receive credit for your answer.** [6 pts each]

5. $(-3, -\sqrt{3})$ _____

6. $(-2.3, -8.5)$ _____

- State the polar coordinates that graph the given point under these conditions.
 $r < 0, -360 < \theta \leq 0^\circ$.[3 pts]

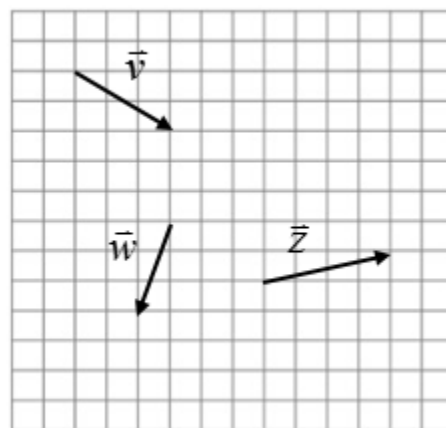
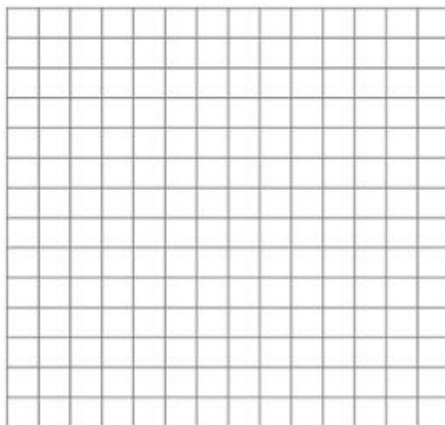
7. _____



- Sketch the resultant using the vectors at the right.[4 pts each]

8. $\vec{v} - 2\vec{w}$

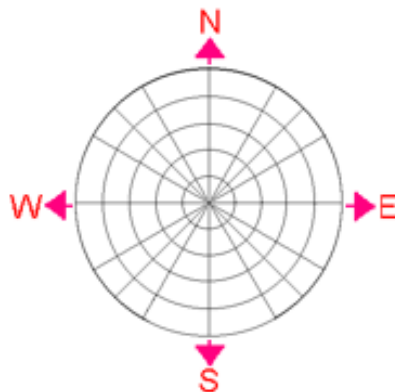
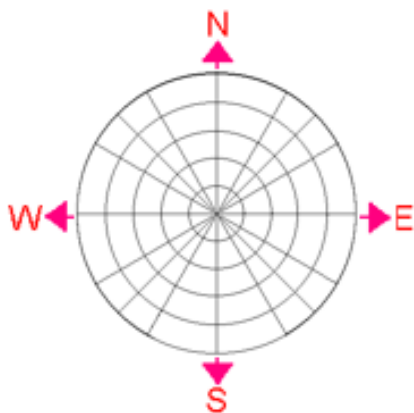
9. $-2\vec{z} + \vec{v} + \vec{w}$



- Sketch each angle.[3 pts each]

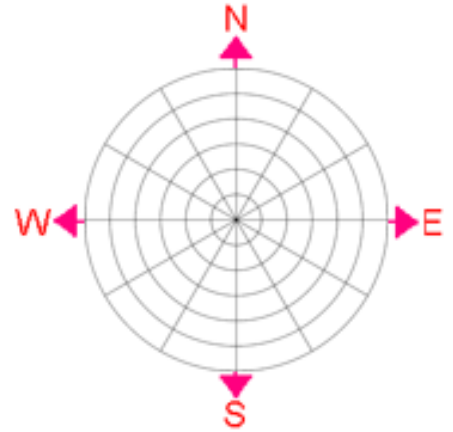
10. a compass bearing of $N 30^\circ E$

11. a true bearing of 150°



- Solve. [5 pts]

12. A ship leaves a port traveling due east for 200 miles. It turns due south and travels 240 miles before becoming disabled in the water. State the **true bearing** (to nearest whole degree) a rescue ship leaving the port must take to meet the disabled ship. **You must show the correct work to receive credit for your answer.**



Part 2: Static Equilibrium and Force Vectors

*****You must show the correct work to support all answers.*****

In problems #1 - 6, find the quantity if $\vec{v} = 4i - 3j$ and $\vec{w} = -12i + 5j$. Give exact answers for lengths. State angles to nearest whole degree. [22 total pts]

1. $2\vec{v} + 3\vec{w}$ _____

2. $\|\vec{v} + \vec{w}\|$ _____

3. $\|\vec{v}\| + \|\vec{w}\|$ _____

4. $\vec{v} \cdot \vec{w}$ _____

5. angle θ between \vec{v} and \vec{w} _____

6. unit vector, \vec{u} , in same direction as \vec{v} _____

7. Ivan pulls a sled loaded with logs to his cabin in the woods. If Ivan pulls with a force of 800 N with a direction angle of 20° , what are the horizontal and vertical components of the force exerted by Ivan? **Round to nearest hundredths. [4 pts]**

a. Horizontal: _____

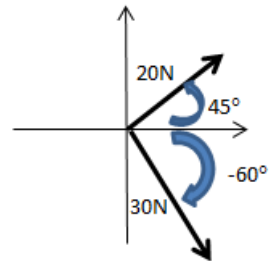


b. Vertical: _____

In problems #8 - 10, round lengths to nearest hundredth. State angles to nearest whole degree.

8. Two forces of magnitude 20 N and 30 N act on an object at angles of 45° and -60° . Calculate the magnitude and the direction of the resultant force. **[8 pts]**

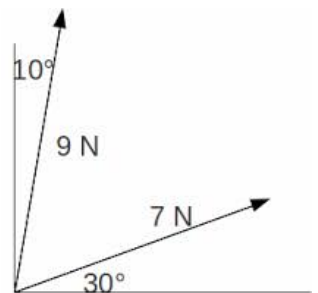
a. Magnitude: _____



b. Direction: _____

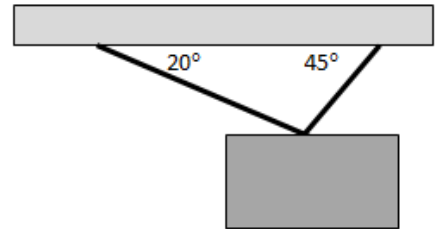
9. Calculate the magnitude of the resultant force using the figure below. **[8 pts]**

a. Magnitude: _____



b. Direction: _____

10. A weight of 1000 pounds is suspended from the ceiling from two cables. What is the tension on each cable? **[8 pts]**



a. **Right Cable:** _____

b. **Left Cable:** _____