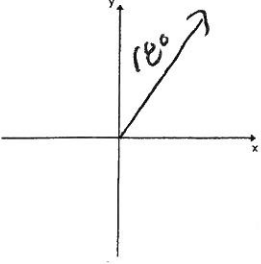
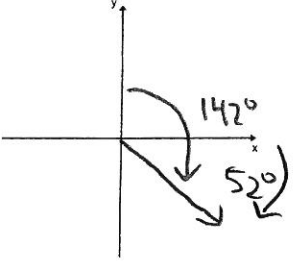
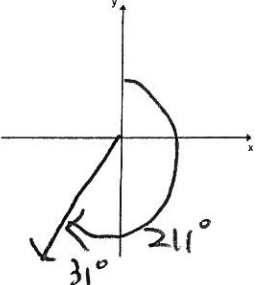
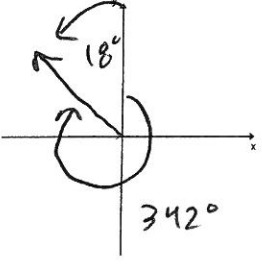


Name \_\_\_\_\_ Describing location using a variety of methods

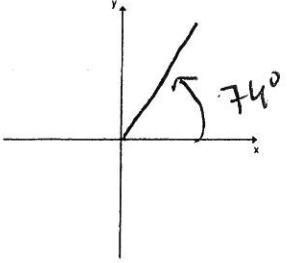
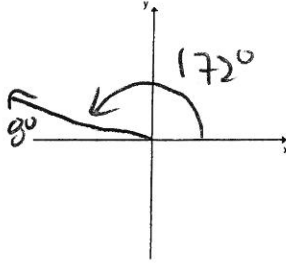
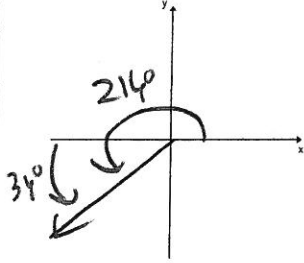
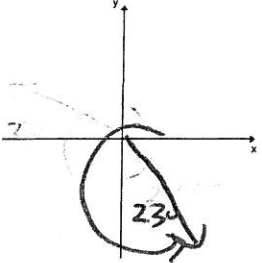
Any Directed Line Segment is called a VECTOR

The length of any directed line segment is called its MAGNITUDE

Bearing – this is a method of describing location based on angles that are formed using NORTH as initial position and angles being measured in a CLOCKWISE manner. (This notation will NOT mention N/S/E/W in its description)

<p>Draw and label the direction vector that has a bearing of <math>18^\circ</math> Assume vector starts at the origin</p> 	<p>Draw and label the direction vector that has a bearing of <math>142^\circ</math> Assume vector starts at the origin</p> 	<p>Draw and label the direction vector that has a bearing of <math>211^\circ</math> Assume vector starts at the origin</p> 	<p>Draw and label the direction vector that has a bearing of <math>342^\circ</math> Assume vector starts at the origin</p> 
<p>heading <math>90 - 18 = 72^\circ</math></p>	<p>heading <math>360 - 52 = 308^\circ</math></p>	<p>heading <math>270 - 31 = 239^\circ</math></p>	<p>heading <math>90 + 18 = 108^\circ</math></p>

Heading -this is a method of describing location based on angles that are formed using EAST as initial position and angles being measured in a COUNTERCLOCKWISE manner. This notation is the MATH notation. This notation will have THREE place values in the naming of the angle. (This notation will NOT mention N/S/E/W in its description)

<p>Draw and label the direction vector that has a heading of <math>074^\circ</math> Assume vector starts at the origin</p> 	<p>Draw and label the direction vector that has a heading of <math>172^\circ</math> Assume vector starts at the origin</p> 	<p>Draw and label the direction vector that has a heading of <math>214^\circ</math> Assume vector starts at the origin</p> 	<p>Draw and label the direction vector that has a heading of <math>293^\circ</math> Assume vector starts at the origin</p> 
<p>bearing <math>90 - 74 = 16^\circ</math></p>	<p>bearing <math>270 + 8 = 278^\circ</math></p>	<p>bearing <math>270 - 34 = 236^\circ</math></p>	<p>bearing <math>180 - 23 = 157^\circ</math></p>

If you are converting between two different notations/descriptions of direction vectors it is useful to determine the ACUTE angles formed within the quadrant in which the vector lies

<p>A bearing of <math>18^\circ</math> means a heading of <u><math>72^\circ</math></u>     <math>90 - 18</math></p>	<p>A heading of <math>074^\circ</math> means a bearing of <u><math>16^\circ</math></u>     <math>90 - 74</math></p>
<p>A bearing of <math>142^\circ</math> means a heading of <u><math>308^\circ</math></u>     <math>360 - 52</math></p>	<p>A heading of <math>172^\circ</math> means a bearing of <u><math>278^\circ</math></u>     <math>270 + 8</math></p>
<p>A bearing of <math>211^\circ</math> means a heading of <u><math>239^\circ</math></u>     <math>270 - 31</math></p>	<p>A heading of <math>214^\circ</math> means a bearing of <u><math>236^\circ</math></u>     <math>270 - 34</math></p>
<p>A bearing of <math>342^\circ</math> means a heading of <u><math>108^\circ</math></u>     <math>90 + 18</math></p>	<p>A heading of <math>293^\circ</math> means a bearing of <u><math>157^\circ</math></u>     <math>180 - 23</math></p>

If you are given N, S, E, W in the naming of the position of a vector, then you must pay attention to HOW they stated the direction.

Method 1: ANGLE direction REFERENCE position

ANGLE North of EAST (starts on EAST position heads COUNTERCLOCKWISE towards North)

ANGLE East of NORTH (starts on NORTH position heads CLOCKWISE towards East)

ANGLE South of EAST (starts on EAST position heads CLOCKWISE towards South)

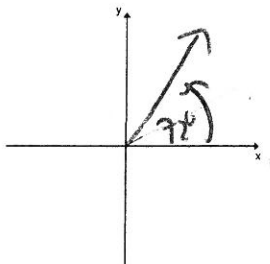
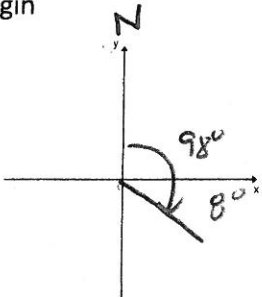
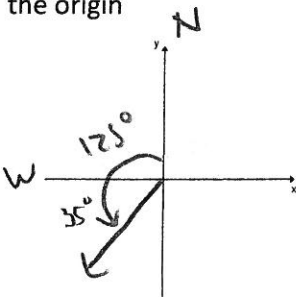
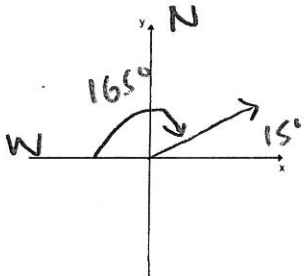
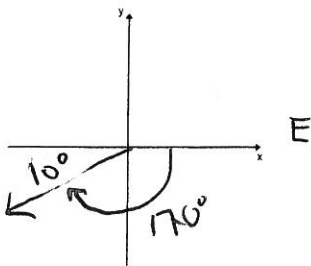
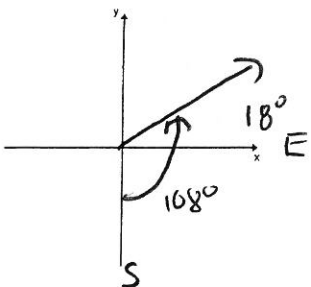
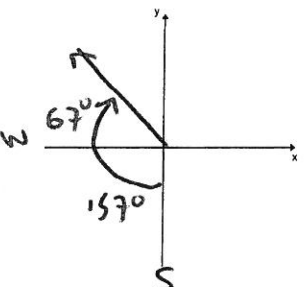
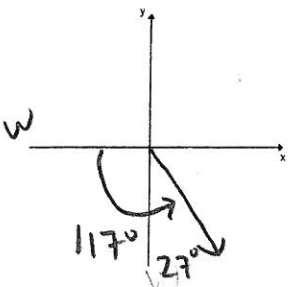
ANGLE East of SOUTH (starts on SOUTH position heads COUNTERCLOCKWISE towards East)

ANGLE North of WEST (starts on WEST position heads CLOCKWISE towards North)

ANGLE West of NORTH (starts on NORTH position heads COUNTERCLOCKWISE towards West)

ANGLE South of WEST (starts on WEST position heads COUNTERCLOCKWISE towards South)

ANGLE West of SOUTH (starts on SOUTH position heads CLOCKWISE towards West)

<p>Draw and label the direction vector that <math>72^\circ</math> North of <b>East</b> Assume vector starts at the origin</p>  <p>This vector starts on the <u>E</u> position and travels in the direction of <u>N</u></p>	<p>Draw and label the direction vector that <math>98^\circ</math> East of <b>North</b> Assume vector starts at the origin</p>  <p>This vector starts on the <u>N</u> position and travels in the direction of <u>E</u></p>	<p>Draw and label the direction vector that <math>125^\circ</math> West of <b>North</b> Assume vector starts at the origin</p>  <p>This vector starts on the <u>N</u> position and travels in the direction of <u>W</u></p>	<p>Draw and label the direction vector that <math>165^\circ</math> North of <b>West</b> Assume vector starts at the origin</p>  <p>This vector starts on the <u>W</u> position and travels in the direction of <u>N</u></p>
<p>Draw and label the direction vector that <math>170^\circ</math> South of <b>East</b> Assume vector starts at the origin</p>  <p>This vector starts on the <u>E</u> position and travels in the direction of <u>S</u></p>	<p>Draw and label the direction vector that <math>108^\circ</math> East of <b>South</b> Assume vector starts at the origin</p>  <p>This vector starts on the <u>S</u> position and travels in the direction of <u>E</u></p>	<p>Draw and label the direction vector that <math>157^\circ</math> West of <b>South</b> Assume vector starts at the origin</p>  <p>This vector starts on the <u>S</u> position and travels in the direction of <u>W</u></p>	<p>Draw and label the direction vector that <math>117^\circ</math> South of <b>West</b> Assume vector starts at the origin</p>  <p>This vector starts on the <u>W</u> position and travels in the direction of <u>S</u></p>

If you are given N, S, E, W in the naming of the position of a vector, then you must pay attention to HOW they stated the direction.

Method 2: REFERENCE position ANGLE direction

ANGLE North of EAST (starts on EAST position heads COUNTERCLOCKWISE towards North)

ANGLE East of NORTH (starts on NORTH position heads CLOCKWISE towards East)

ANGLE South of EAST (starts on EAST position heads CLOCKWISE towards South)

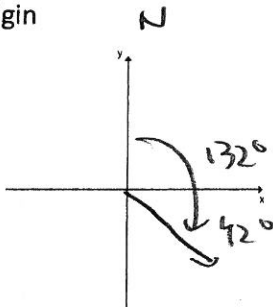
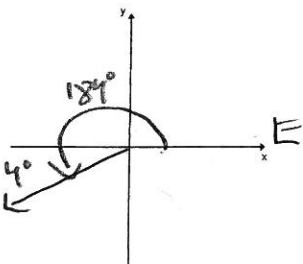
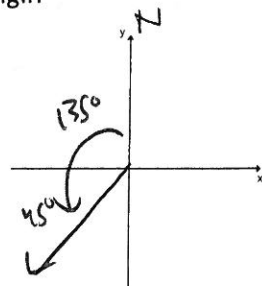
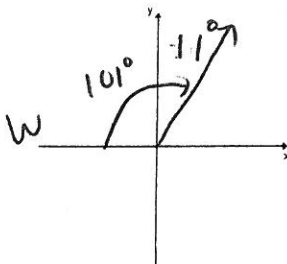
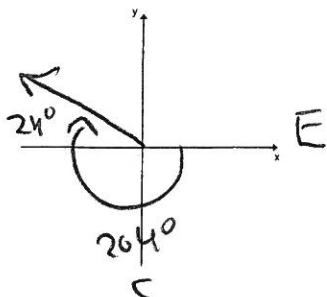
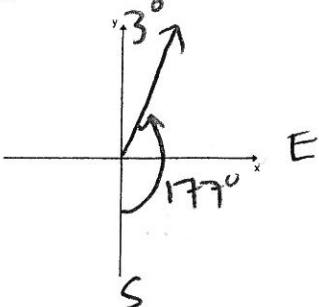
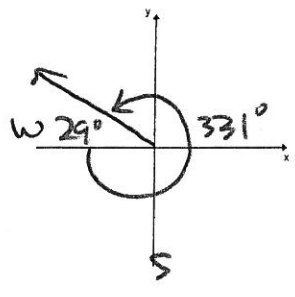
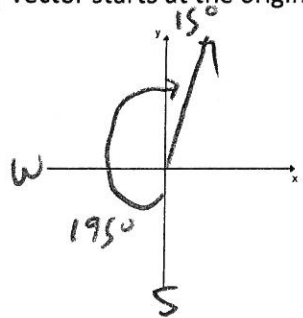
ANGLE East of SOUTH (starts on SOUTH position heads COUNTERCLOCKWISE towards East)

ANGLE North of WEST (starts on WEST position heads CLOCKWISE towards North)

ANGLE West of NORTH (starts on NORTH position heads COUNTERCLOCKWISE towards West)

ANGLE South of WEST (starts on WEST position heads COUNTERCLOCKWISE towards South)

ANGLE West of SOUTH (starts on SOUTH position heads CLOCKWISE towards West)

<p>Draw and label the direction vector that <b>North</b> 132° East Assume vector starts at the origin</p>  <p>This vector starts on the <u>N</u> position and travels in the direction of <u>E</u></p>	<p>Draw and label the direction vector that <b>East</b> 184° North Assume vector starts at the origin</p>  <p>This vector starts on the <u>E</u> position and travels in the direction of <u>N</u></p>	<p>Draw and label the direction vector that <b>North</b> 135° West Assume vector starts at the origin</p>  <p>This vector starts on the <u>N</u> position and travels in the direction of <u>W</u></p>	<p>Draw and label the direction vector that <b>West</b> 101° North Assume vector starts at the origin</p>  <p>This vector starts on the <u>W</u> position and travels in the direction of <u>N</u></p>
<p>Draw and label the direction vector that <b>East</b> 204° South Assume vector starts at the origin</p>  <p>This vector starts on the <u>E</u> position and travels in the direction of <u>S</u></p>	<p>Draw and label the direction vector that <b>South</b> 177° East Assume vector starts at the origin</p>  <p>This vector starts on the <u>S</u> position and travels in the direction of <u>E</u></p>	<p>Draw and label the direction vector that <b>West</b> 331° South Assume vector starts at the origin</p>  <p>This vector starts on the <u>W</u> position and travels in the direction of <u>S</u></p>	<p>Draw and label the direction vector that <b>South</b> 195° West Assume vector starts at the origin</p>  <p>This vector starts on the <u>S</u> position and travels in the direction of <u>W</u></p>

Hint: knowing the acute angles in the quadrant formed by the vector is very helpful

This is a bearing of  $233^\circ$   
 $\frac{270 - 37 = 180 + 53}{180 + 53}$   
 This is a heading of  $217^\circ$   
 $\frac{180 + 37}{360 - 53}$

North  $233^\circ$  East  $\uparrow$   
 $180 + 37$   $180 + 53^\circ$

East  $217^\circ$  North  $\uparrow$   
 $180 + 53$   $180 + 37$

East  $143^\circ$  South  $\downarrow$   
 $360 - 53^\circ$   $180 - 37$

This is a bearing of  $131^\circ$   
 $\frac{90 + 41}{90 + 41}$   
 This is a heading of  $319^\circ$   
 $\frac{270 + 49}{270 + 49}$

North  $131^\circ$  East  $\uparrow$   
 $90 + 41$   $90 + 41$

East  $319^\circ$  North  $\uparrow$   
 $180 - 49$   $270 + 49$

East  $41^\circ$  South  $\downarrow$   
 $360 - 49$   $270 - 49$

This is a bearing of  $204^\circ$   
 $\frac{90 - 24}{90 - 24}$   
 This is a heading of  $24^\circ$   
 $\frac{270 + 24}{270 + 24}$

South  $24^\circ$  West  $\uparrow$   
 $180 + 24$   $180 + 24$

West  $156^\circ$  North  $\uparrow$   
 $270 + 24$   $180 - 24$

West  $204^\circ$  South  $\downarrow$   
 $270 - 24$   $180 + 24^\circ$

This is a bearing of  $332^\circ$   
 $\frac{360 - 28}{360 - 28}$   
 This is a heading of  $118^\circ$   
 $\frac{90 + 28}{90 + 28}$

North  $20^\circ$  West  $\uparrow$   
 $90 - 28$   $90 - 28$

West  $62^\circ$  North  $\uparrow$   
 $270 + 28$   $90 - 28$

West  $152^\circ$  South  $\uparrow$   
 $270 - 28$   $270 - 28$

It is very important to realize that the answers in the heading and bearing column must be different (unless  $45^\circ$  or  $225^\circ$  present)

It is very important to realize that the answers in the last two columns are very different

There is a reason I underlined what I underlined