Measuring Angles and Applications of Vectors
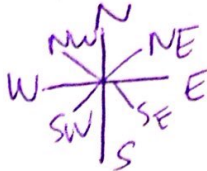
1. Draw a set of axes. Label N, S, E, and W. Then write the degree measures. Next, label NE, SE, SW and NW and find their degree measures so that NE is exactly halfway between N and E.
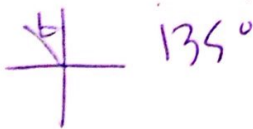

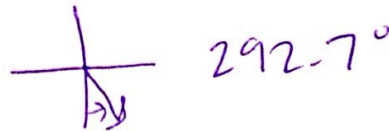2. What would it look like if you drew an angle that was 30° west of north?

Notation: **N30°W**

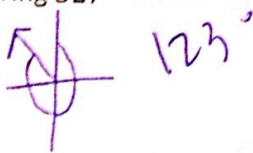**For each of the following, draw a picture and use the picture to write the angle in standard form.**

3. N45°W

 135°
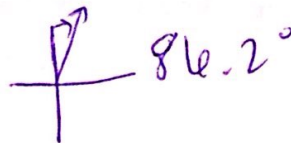
4. S22.7°E

 292.7°
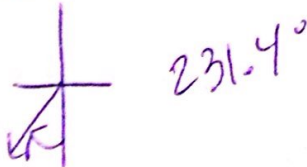
5. Bearing 327°

 123°

6. N3.8°E

 86.2°

7. S38.6°W

 231.4°

8. S15.8°W

 354.2°

9. Bearing 13.9°

 76.1°

10. N42.61°E

 47.39°
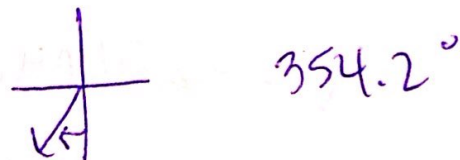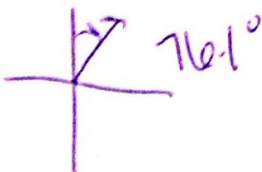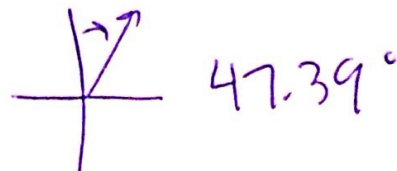
Given the standard form, draw a picture and then fill in the blank.

11. 22.7° → Bearing 67.3°

12. 213.45° → S 56.55° W

13. 97.4° → N 7.4° W

14. 335.6° → S 65.6° E

15. 18.2° → N 71.8° E

16. 316.58° → Bearing 133.42°

17. 174.6° → N 84.6° W

18. 264.8° → S 5.2° W

Use the equation that writes a vector in terms of magnitude (speed) and direction (based on the angle of the vector) to write a vector for each of the following. Write both the approximate answer and the exact answer, if possible. Round all decimals to the nearest hundredth.

$$v = \|v\|(\cos\theta i + \sin\theta j)$$

19. A plane is heading 32° west of north at a speed of 536 mph.

$$V = -284.04i + 454.55j$$

20. A boat is heading $S53°E$ at a speed of 20 mph.

$$V = 20\cos 323 i + 20\sin 323 j$$
$$V = 15.97 i - 12.04 j$$

21. A car is heading directly east at a speed of 68 mph.

$$V = 68\cos 0 i + 68\sin 0 j$$
$$V = 68 i$$

22. A really small child is bearing 128° at a speed of 3 feet per minute.

$$V = 3\cos 322 i + 3\sin 322 j$$
$$V = 2.36 i - 1.85 j$$

23. A really large cat is running $S13.5°W$ at a speed of 48 feet per minute.

$$V = 48\cos 256.5 i + 48\sin 256.5 j$$
$$V = -11.21 i - 46.67 j$$

24. A tiny hamster is scurrying $N16.27°E$ at a speed of $\frac{1}{28}$ feet per second.

$$V = \frac{1}{28}\cos 73.73 i + \frac{1}{28}\sin 73.73 j$$
$$V = .01 i + .03 j$$

25. A cuddly panda is BEARing 343.7° at $\frac{1}{2}$ feet per second.

$$V = -.14i + .48j$$

26. An adorable grandma is walking $S72°W$ at a speed of 5 feet per minute.

$$V = -4.74i - 1.55j$$