For each of the following, draw a picture and write the angle in standard form

1.)   N45°W   2.)   S22.7°E   3.)   Bearing 327°

Given the standard form, draw the picture and fill in the blank

4.)   22.7° → Bearing_____   5.)   213.45°→S_____ _____

6.)   97.4°→ N_____ _____   7.)   316.58°→ Bearing_____

Use the equation that writes a vector in terms of magnitude (speed) and direction to write a vector for each of the following. Write exact if possible and approximate to the nearest hundredths

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

8.)   A plane heading 32° west of north at a speed of 536 mph.

9.)   A car heading directly east at a speed of 68 mph

10.)   A plane bearing 60° at a speed 328 mph

11.)   A Jumbo jet maintains an airspeed of 550 mph in a southwesterly direction. The velocity of the jet stream is a constant 80 mph from the west. Find the actual speed and direction.

a) What angle is the jet flying from standard position?

b) Write the vector that represents the magnitude and direction of the jet.(exact numbers)

c) What is the angle of the wind from standard position?

d) Write the vector that represents the magnitude and direction of the wind. (exact numbers)

e) Find the vector that represents the magnitude and direction of the jet and the wind combined

f) Find the speed of the jet and wind combined (speed is magnitude) round to three places

g) Find the direction of the jet & wind combined, this is the actual direction the aircraft will be.
   Draw the picture of your angles, round to three places

h) What direction is the jet actually flying?

12.) Burt and Ernie meet up to fly a toy helicopter. At full power it can fly 100km per hour in calm air. Burt has the controls and he makes the helicopter take off heading N45°E. After he feels comfortable he turns on full power. A steady wind begins to blow from the north to the south at a speed of 32 km per hour.   In what direction and what speed is the helicopter flying now?

13.) A ship is traveling at a speed of 60 mph with a bearing of 60° on the river with negligible water velocity. When the ship reaches a certain point, it encounters water flow with a velocity of 10 mph in the direction S45°E. What are the resultant speed and direction of the ship?

Find each point based on the parametric equations

14.) $x = |t - 3|$ and $y = \frac{1}{2t}$

    a) t = -8   b) $t = \frac{1}{2}$

15.) $x = t^2 + 5t$ and $y = 3 - t^2$

    a) t = -1   b) t = 0

16.) $x(t) = \frac{3}{t}$

    $y(t) = 6t + 1$

17.) $x(t) = \sqrt{t}$

    $y(t) = \sqrt{4 - t}$

Convert the parametric equations to rectangular form

18.) $x(t) = 8 - t$

    $y(t) = t^2 + 10t - 100$

19.) $x(t) = 2 + 5\sec(t)$

    $y(t) = 1 + 3\tan(t)$