

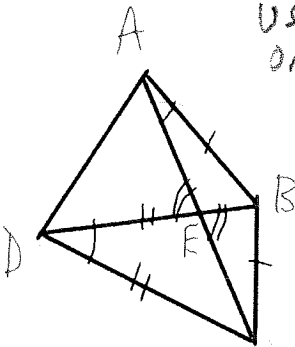
Sheet 161: Bisectors and Vertical Angles Practice

Name: KEY

1. Find the midpoint of a segment with endpoints (3, 4) and (-1, 1).

$$\left(\frac{3-1}{2}, \frac{4+1}{2} \right) = \left(1, \frac{5}{2} \right)$$

2. Write the congruent angles and the congruent sides on the triangle shown using the letters A, B, and C, D, and E as usual.



USING FIGURE ONLY, NO THEOREMS

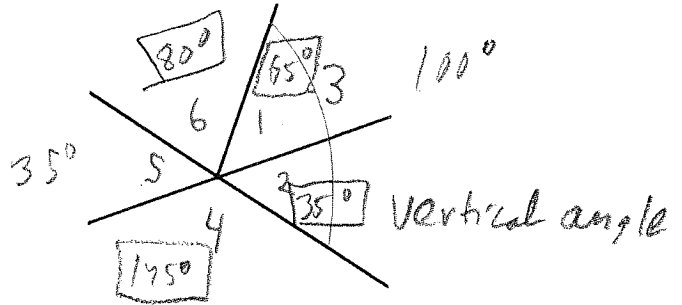
- i) $\overline{AB} \cong \overline{BC}$
- ii) $\overline{AD} \cong \overline{DC}$
- iii) $\angle BAE \cong \angle BEC$
- iv) $\angle AED \cong \angle BEC$

NOTE: $\angle BAE \cong \angle BAC$

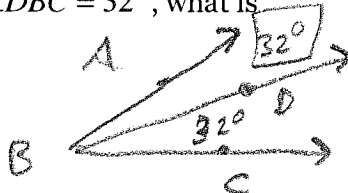
- c) Which angles are definitely congruent?

$$\angle 2 \cong \angle 5$$

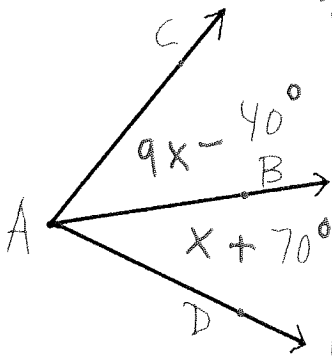
- d) If $m\angle 5 = 35^\circ$ and $m\angle 3 = 100^\circ$, find the measures of as many of the other angles as possible (you cannot assume that angles that look like right angles are right angles)?



3. Sketch this figure. ("Sketch" means ruler, protractor, and compass are not needed). \overline{BD} bisects $\angle ABC$. If $m\angle DBC = 32^\circ$, what is $m\angle ABD$?



4. \overline{AB} bisects $\angle CAD$. Find x and all three angles.



Bisected: $\angle BAC \cong \angle BAD$
 $9x - 40 = x + 70$

$$8x = 110$$

$$x = 110/8$$

$$x = 13.75$$

$$m\angle BAC = 83.75^\circ$$

$$m\angle BAD = 83.75^\circ$$

$$m\angle CAD = 167.5^\circ$$

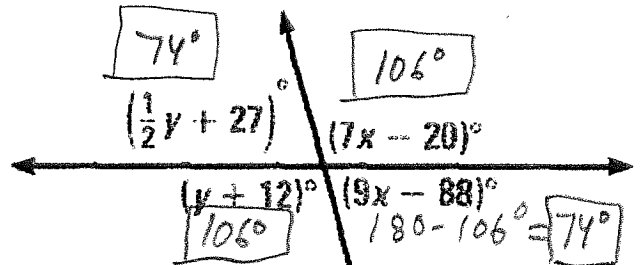
6. Find the measure of an angle that is complementary to an angle with measure 40° .

$$90^\circ - 40^\circ = 50^\circ$$

7. Find the measure of an angle that is supplementary to an angle with measure 80° .

$$180^\circ - 80^\circ = 100^\circ$$

8. Find x , y and all angles.



Linear Pairs are supplementary

$$7x - 20 + 9x - 88 = 180$$

$$16x = 180 + 20 + 88$$

$$16x = 288$$

$$x = 18$$

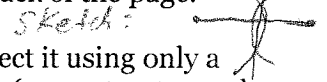
$$7x - 20 = 106^\circ$$

Vertical \angle s are congruent.

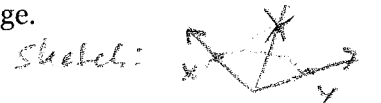
$$y + 12 = 106$$

$$y = 94$$

9. Draw a segment. Bisect it using only a compass and straightedge (no ruler markings). Leave the compass marks. Use the back of the page.



10. Draw an obtuse angle. Bisect it using only a compass and straight edge (no protractor and no ruler markings). Leave the compass marks. Use the back of the page.



5. Contemplate the figure below.

- a) Which angles form linear pairs?

$$\angle 3 \& \angle 6, \angle 4 \& \angle 5, \angle 2 \& \angle 4.$$

- b) Which angles are vertical angles?

$$\angle 2 \& \angle 5$$