

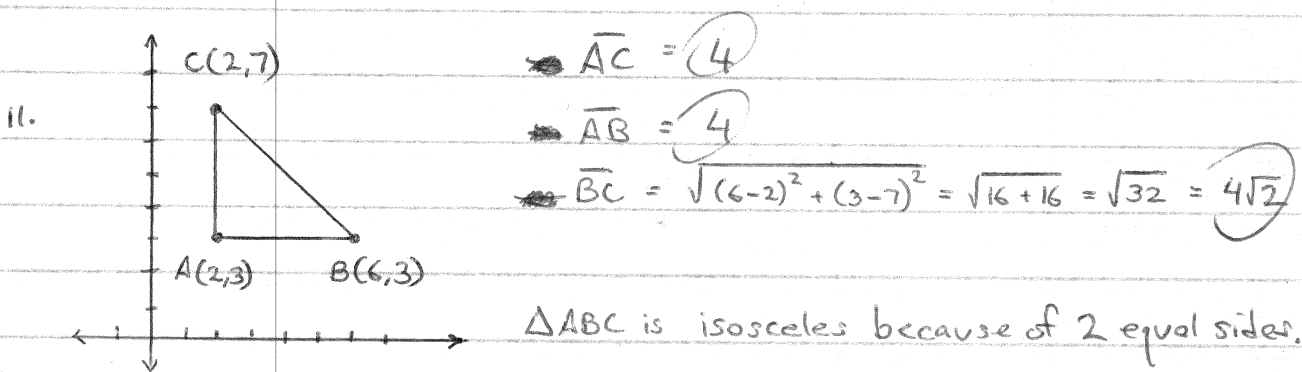
Geometry Ch 4-1, Exercises pg 211, #1-7, 11-19, 21-28, 32-37, 49

Match triangle description with most specific name.

- |   |                 |
|---|-----------------|
| 1. Angle measures: $30^\circ, 60^\circ, 90^\circ$ | → A Isosceles   |
| 2. Side lengths: 2cm, 2cm, 2cm                    | → B Scalene     |
| 3. Angle meas: $60^\circ, 60^\circ, 60^\circ$     | → C Right       |
| 4. Side lengths: 6m, 3m, 6m                       | → D Obtuse      |
| 5. Side lengths: 5A, 7A, 9A                       | → E Equilateral |
| 6. Angle meas: $20^\circ, 125^\circ, 35^\circ$    | → F Equiangular |

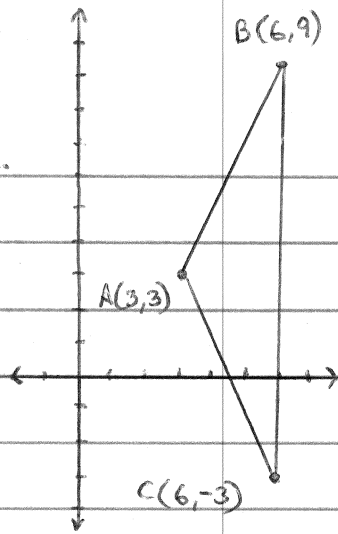
7. Can a right triangle also be obtuse? Justify/explain.  
 No. The other two angles sum to  $90^\circ$ , neither of which can be greater than  $90^\circ$ , the criteria for obtuse.

Graph the triangle with the given vertices. Classify it by its sides, and determine if it is a right  $\Delta$ .



$\overline{AC}$  is a vertical line,  $\overline{AB}$  is a horizontal, and thus their intersection is a perpendicular.  $\Delta ABC$  is also right.

12.

SIDE MEASURES

$$AB = \sqrt{(6-3)^2 + (9-3)^2} = \sqrt{9+36} = \sqrt{45} = 3\sqrt{5}$$

$$BC = 12$$

$$CA = \sqrt{(-3-3)^2 + (6-3)^2} = \sqrt{36+9} = \sqrt{45} = 3\sqrt{5}$$

$\triangle ABC$  isosceles because of 2 equal sides.

SLOPES

$$m_{AB} = \frac{9-3}{6-3} = \frac{6}{3} = 2$$

$$m_{BC} = \frac{-3-9}{6-6} = \frac{-12}{0} = \text{Und.}$$

$$m_{CA} = \frac{-3-3}{6-3} = \frac{-6}{3} = -2$$

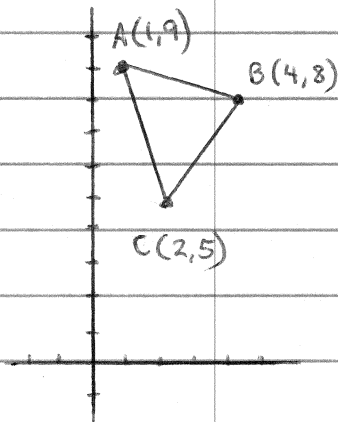
$\triangle ABC$  is not right

because slopes

indicate there are

no  $\perp$  intersections.

13.

SIDE MEASURES

$$AB = \sqrt{(8-9)^2 + (4-1)^2} = \sqrt{1+9} = \sqrt{10}$$

$$BC = \sqrt{(8-5)^2 + (4-2)^2} = \sqrt{9+4} = \sqrt{13}$$

$$CA = \sqrt{(2-1)^2 + (5-9)^2} = \sqrt{1+16} = \sqrt{17}$$

$\triangle ABC$  is scalene because no two sides are equal.

SLOPES

$$m_{AB} = \frac{8-9}{4-1} = \frac{-1}{3}$$

$$m_{BC} = \frac{8-5}{4-2} = \frac{3}{2}$$

$$m_{CA} = \frac{5-9}{2-1} = \frac{-4}{1}$$

$\triangle ABC$  is not right

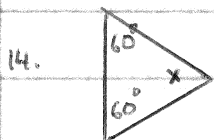
because slopes

indicate that there

are no perpendicular

intersections.

Find the value of  $x$ ; classify the triangle by its angles.

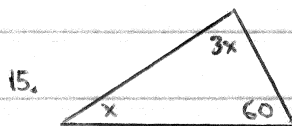


$$60 + 60 + x = 180$$

$$120 + x = 180$$

$$x = 60$$

Equiangular



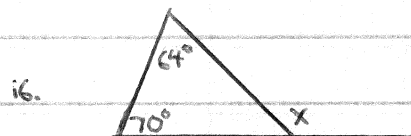
$$x + 3x + 60 = 180$$

$$4x = 120$$

$$x = 30$$

$30^\circ, 90^\circ, 60^\circ$

Right



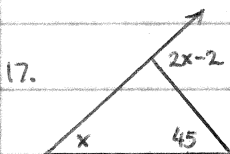
$$70 + 64 = x$$

$$134 = x$$

$70^\circ, 64^\circ, 46^\circ$

Acute

ALGEBRA Find the measure [not just  $x$ ] of exterior angle shown



$$x + 45 = 2x - 2$$

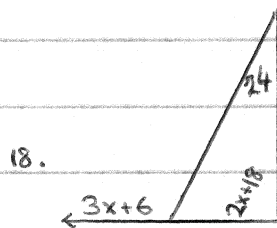
$$47 = x$$

Ext. Angle:

$$= 2(47) - 2$$

$$= 94 - 2$$

$$= \textcircled{92}$$



$$3x + 6 = 24 + 2x + 18$$

$$3x + 6 = 2x + 42$$

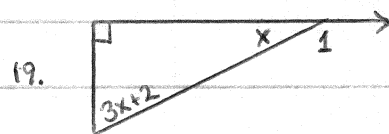
$$x = 36$$

Ext Angle:

$$= 3(36) + 6$$

$$= 108 + 6$$

$$= \textcircled{114}$$



$$(90) + (3x + 2) + (x) = 180$$

$$4x + 92 = 180$$

$$4x = 88$$

$$x = 22$$

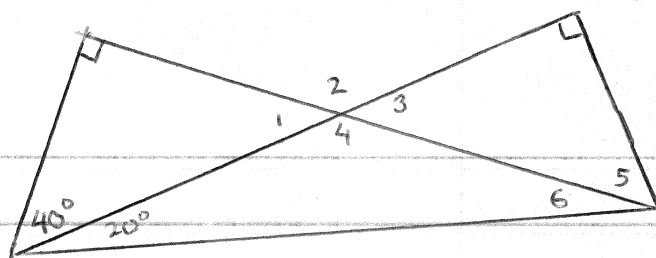
Ext Angle:

$$x + \angle 1 = 180$$

$$22 + \angle 1 = 180$$

$$\angle 1 = \textcircled{158}$$

Find the measure of each numbered angle.



21.  $\angle 1$

$$\angle 1 + 40^\circ + 90^\circ = 180^\circ$$

$$\angle 1 + 130^\circ = 180^\circ$$

$$\boxed{\angle 1 = 50^\circ}$$

22.  $\angle 2$

$$\angle 1 + \angle 2 = 180^\circ \quad [\text{Linear Pair}]$$

$$50 + \angle 2 = 180$$

$$\boxed{\angle 2 = 130^\circ}$$

23.  $\angle 3$

$$\angle 1 = \angle 3 \quad [\text{Vertical Angles}]$$

$$\boxed{50^\circ = \angle 3}$$

24.  $\angle 4$

$$\angle 2 = \angle 4 \quad [\text{Vertical Angles}]$$

$$\boxed{130^\circ = \angle 4}$$

25.  $\angle 5$

$$\angle 3 + 90^\circ + \angle 5 = 180$$

$$50 + 90 + \angle 5 = 180$$

$$140 + \angle 5 = 180$$

$$\boxed{\angle 5 = 40^\circ}$$

26.  $\angle 6$

~~20 + 130 + \angle 6 = 180~~  
~~150 + \angle 6 = 180~~  
~~\angle 6 = 30~~  
 oops

$$20^\circ + \angle 4 + \angle 6 = 180$$

$$20 + 130 + \angle 6 = 180$$

$$150 + \angle 6 = 180$$

$$\boxed{\angle 6 = 30}$$

27. ALGEBRA In  $\triangle PQR$ ,  $\angle P \cong \angle R$  and the measure of  $\angle Q$  is twice the measure of  $\angle R$ . Find the measure of each angle.

$$\angle P + \angle Q + \angle R = 180$$

$$\angle R + 2\angle R + \angle R = 180$$

$$4\angle R = 180$$

$$\angle R = 45^\circ; \angle P = 45^\circ; \angle Q = 90^\circ$$

28. ALGEBRA In  $\triangle EFG$ ,  $m\angle F = 3m\angle G$ ;  $m\angle E = m\angle F - 30$ . Find the measure of each angle.

$$\angle E + \angle F + \angle G = 180$$

$$(\angle F - 30) + (\angle F) + \left(\frac{1}{3}\angle F\right) = 180$$

$$\angle F + \angle F + \frac{1}{3}\angle F = 210$$

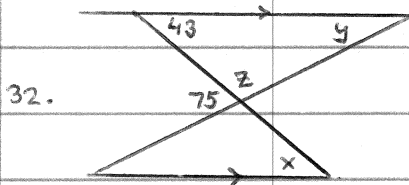
$$\frac{7}{3}\angle F = 210$$

$$\angle F = \frac{3}{7}(210) = 90^\circ$$

$$\angle E = (90) - 30 = 60^\circ$$

$$\angle G = \frac{1}{3}(90) = 30^\circ$$

Find the values of  $x$  and  $y$ .



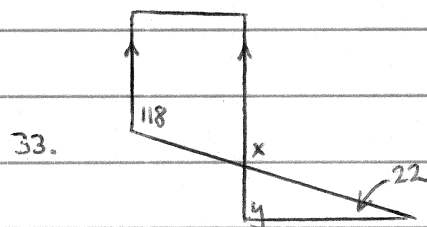
$$\angle X = 43^\circ; \text{Alt. Interior Angles}$$

$$75^\circ + \angle Z = 180 \quad \text{Linear Pair}$$

$$\angle Z = 105$$

$$43 + 105 + \angle y = 180$$

$$\angle y = 32^\circ$$



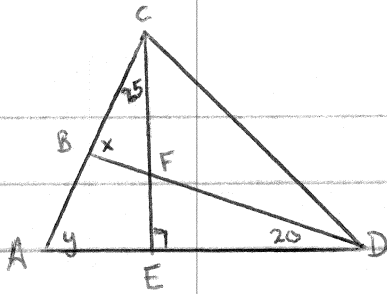
$$\angle X = 118; \text{Corresponding angles}$$

$$\angle X = \angle y + 22^\circ; \text{ext. angle thm}$$

$$118 = \angle y + 22$$

$$96 = \angle y$$

34.



$$\triangle ACE: \angle y + 25 + 90 = 180$$

$$\boxed{\angle y = 65}$$

$$\triangle DEF: 20 + 90 + \angle DEF = 180$$

$$\angle DEF = 70$$

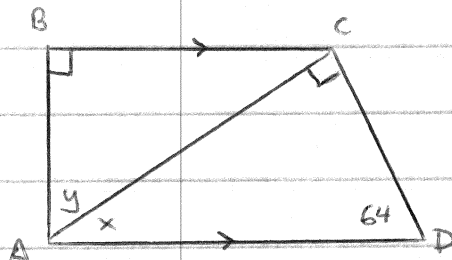
$$\angle BFC = 70, \text{ Vertical Angles}$$

$$\triangle BCF: \angle x + 25 + 70 = 180$$

$$\boxed{\angle x = 85}$$

[There are other methods to solve this]

35.



$$\triangle ACD: \angle x + 90 + 64 = 180$$

$$\boxed{\angle x = 26}$$

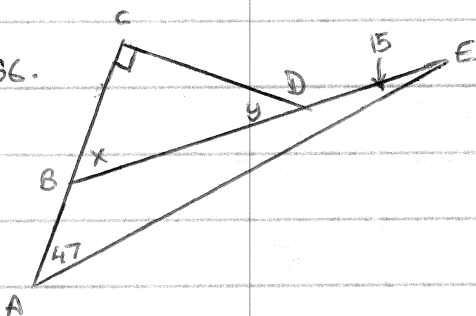
$\angle BAD$  is  $90^\circ$ ; [ $\overline{AD}$  and  $\overline{BC}$  are both parallel to a  $\perp$  transversal]

$$x + y = 90$$

$$26 + y = 90$$

$$\boxed{y = 64}$$

36.



$$\triangle ABE: 47 + 15 + \angle ABE = 180$$

$$\angle ABE = 118$$

$$\angle x + 118 = 180; \text{ Linear Pair}$$

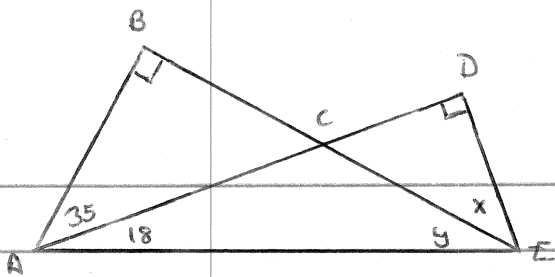
$$\boxed{\angle x = 62}$$

$$\triangle BCD: \angle x + 90 + \angle y = 180$$

$$62 + 90 + \angle y = 180$$

$$\boxed{\angle y = 28}$$

37.



$$\triangle ABE: (35+18) + 90 + \angle y = 180$$

$$143 + \angle y = 180$$

$$\boxed{\angle y = 37}$$

$$\triangle ADE: 18 + 90 + (x+y) = 180$$

$$18 + 90 + x + 37 = 180$$

$$145 + x = 180$$

$$\boxed{\angle x = 35}$$

49. The measures of the angles of a triangle are  $2\sqrt{2x}$ ,  $5\sqrt{2x}$ , and  $2\sqrt{2x}$ .

a. Write an equation that shows the relationship of these three angles.

$$2\sqrt{2x} + 5\sqrt{2x} + 2\sqrt{2x} = 180$$

b. Find the measure of each angle.

$$9\sqrt{2x} = 180$$

$$\sqrt{2x} = 20$$

$$2x = 400$$

$$x = 200$$

$$2\sqrt{2(200)} = 2\sqrt{400} = 2(20) = 40$$

$$5\sqrt{2(200)} = 5\sqrt{400} = 5(20) = 100$$

$$2\sqrt{2(200)} = 2\sqrt{400} = 2(20) = 40$$

c. Classify the triangle by its angles. Obtuse

[Classify by sides: Isosceles]