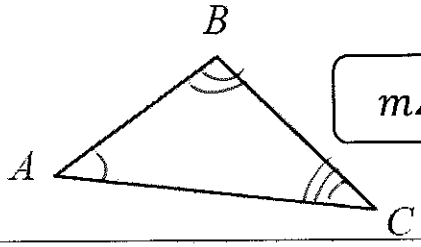
Main Ideas/Questions	Notes	3.5 Triangles and Parallel Lines

Triangle Angle Sum Theorem

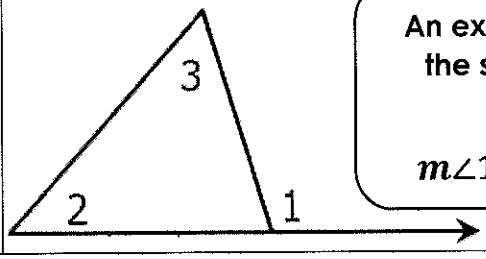
The sum of the measures of the interior angles of a triangle is 180°



$m\angle A + m\angle B + m\angle C = 180°$

Exterior Angle Theorem

An exterior angle is formed by extending any one side of the triangle.

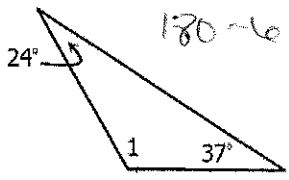


An exterior angle is always equal to the sum of the two non-adjacent interior angles.

$m\angle 1 =$ m∠2 + m∠3

Directions: Find all missing angles.

1.

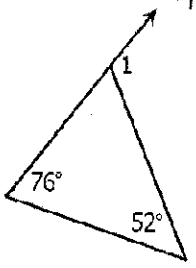


24 + 37 = 61

180 − 61 = 119

$m\angle 1 =$ 119°

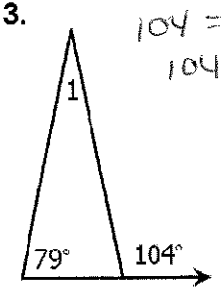
2.



76 + 52 = 128

$m\angle 1 =$ 128°

3.

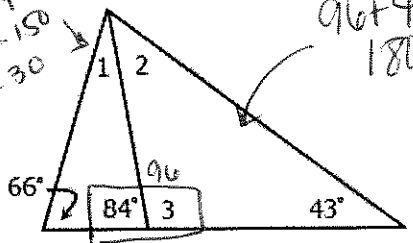


104 = 79 + ∠1

104 − 79 = 25

$m\angle 1 =$ 25°

4.



66 + 84 = 150

180 − 150 = 30

96 + 43 = 139

180 − 139 = 41

linear pair

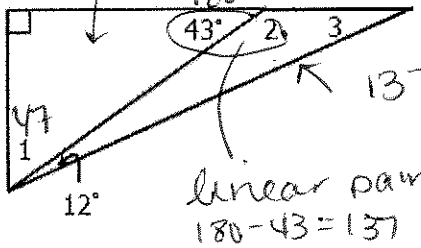
180 − 84 = 96

$m\angle 1 =$ 30°

$m\angle 2 =$ 41°

$m\angle 3 =$ 96°

5.



90 + 43 = 133

180 − 133 = 47

137 + 12 = 149

180 − 149 = 31

linear pair

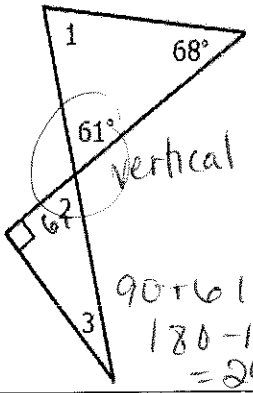
180 − 43 = 137

$m\angle 1 =$ 47

$m\angle 2 =$ 137

$m\angle 3 =$ 31°

6.



61 + 68 = 129

180 − 129 = 51

90 + 61 = 151

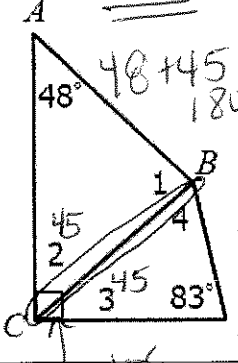
180 − 151 = 29

$m\angle 1 =$ 51°

$m\angle 2 =$ 61°

$m\angle 3 =$ 29°

7. $\overline{BC}$ bisects $\angle ACD$.



48 + 45 = 93

180 − 93 = 87

83 + 45 = 128

180 − 128 = 52

bisector

$m\angle 1 =$ 87°

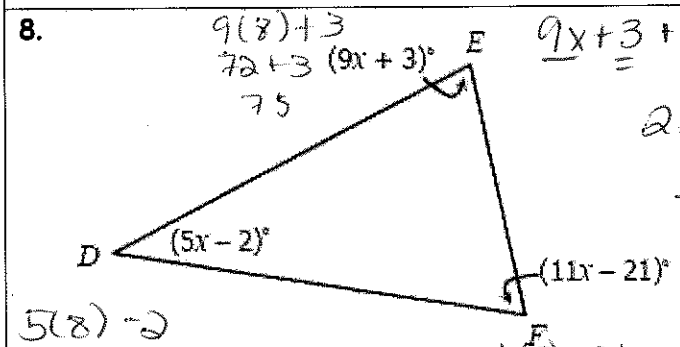
$m\angle 2 =$ 45°

$m\angle 3 =$ 45°

$m\angle 4 =$ 52°

Directions: Solve for x, then find each angle measure.

8.



$9(8)+3$
$72+3$
75

$9x+3+5x-2+11x-21=180$

$25x-20=180$
$+20 \quad +20$

$\frac{25x}{25}=\frac{200}{25}$

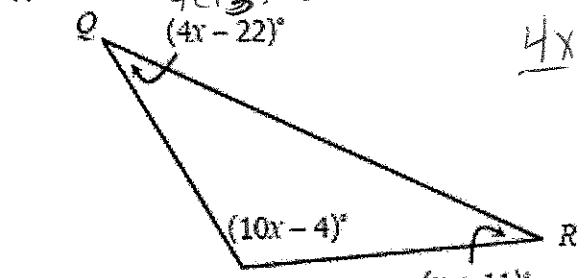
$x=8$

$5(8)-2$
$40-2$
38

$11(8)-21$
$88-21$
67

$x = 8$
$m\angle D = 38°$
$m\angle E = 75$
$m\angle F = 67°$

9.



$4(13)-22$

$4x-22+10x-4+x+11=180$

$15x-15=180$

$15x=195$

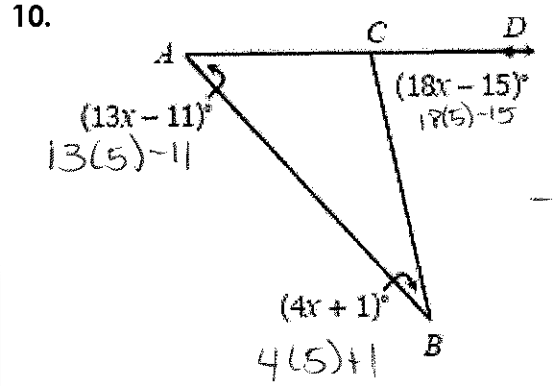
$x=13$

$10(13)-4$

$13+11$

$x = 13$
$m\angle P = 126°$
$m\angle Q = 30°$
$m\angle R = 24°$

10.



$18x-15 = 13x-11+4x+1$

$18x-15 = 17x-10$
$-17x \quad -17x$

$x-15=-10$
$+15 \quad +15$

$x=5$

$13(5)-11$

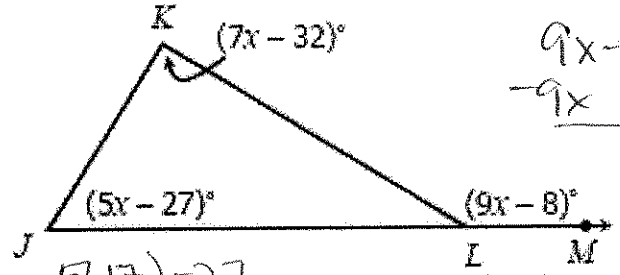
$18(5)-15$

$4(5)+1$

$x = 5$
$m\angle CAB = 54°$
$m\angle ABC = 21$
$m\angle ACB = 105°$
$m\angle DCB = 75$

$54+21$
75
$180-75$

11.



$7(17)-32$

$9x-8 = 7x-32+5x-27$

$9x-8 = 12x-59$
$-9x \quad -9x$

$-8=3x-59$
$+59 \quad +59$

$\frac{51}{3}=\frac{3x}{3}$

$17=x$

$5(17)-27$

$9(17)-8$

$x = 17$
$m\angle JKL = 87°$
$m\angle KJL = 58°$
$m\angle KLJ = 35°$
$m\angle KLM = 145°$

$87+58=145$
$180-145$