Types of Triangles with Algebra

1. In $\triangle ABC$, m$\angle A = 3x$, m$\angle B = 4x - 19$, and m$\angle C = 3x - 1$. Which statement is true? $\triangle ABC$ is

(1) Isosceles   (3) Acute

(2) Obtuse   (4) Right

all less than 90°

$3(20) = 60$
$4(20) - 19 = 61$
$3(20) - 1 = 59$

$3x + 4x - 19 + 3x - 1 = 180$
$10x - 20 = 180$
$ +20 \quad +20$
$\dfrac{10x}{10} = \dfrac{200}{10}$

$x = 20$

2. The angles of a triangle are in a ratio of 2:2:5. The triangle must be:

(1) Scalene   (3) Acute

(2) Right   (4) Obtuse

has an angle more than 90°

$2x + 2x + 5x = 180$
$\dfrac{9x}{9} = \dfrac{180}{9}$
$x = 20$

$2(20) = 40$
$2(20) = 40$
$5(20) = 100$

3. The measures of the angles of a triangle are 7x + 6, 9x − 20, and 3x + 4. The triangle is:

(1) acute and scalene   (3) obtuse and isosceles

(2) acute and isosceles   (4) obtuse and scalene

$7(10) + 6 = 76$
$9(10) - 20 = 70$ all less than 90
$3(10) + 4 = 34$ all different

$7x + 6 + 9x - 20 + 3x + 4 = 180$
$19x - 10 = 180$
$ +10 \quad +10$
$\dfrac{19x}{19} = \dfrac{190}{19}$
$x = 10$

4. The measure of the angles of a triangle are 5x + 2, 5x − 7, and 4x + 17. The triangle is:

all less than 90° (1) acute   (3) isosceles

(2) right   (4) obtuse

$5(12) + 2 = 62$
$5(12) - 7 = 53$
$4(12) + 17 = 65$

$5x + 2 + 5x - 7 + 4x + 17 = 180$
$14x + 12 = 180$
$ -12 \quad -12$
$\dfrac{14x}{14} = \dfrac{168}{14}$
$x = 12$

5. The measures of the angles of a triangle are x − 2, 5x + 13, and 3x − 2. The triangle is:
(1) isosceles   (3) obtuse
(2) right   (4) acute

19-2 = 17   has an angle
5(14)+13 = 108   more than 90°
3(14)-2 = 55

$x-2+5x+13+3x-2=180$
$9x+9=180$
$-9 \quad -9$
$\dfrac{9x=171}{9} \quad \dfrac{}{9}$
$x=19$

6. The measure of the angles of a triangle are 7x + 9, 2x + 3, and 4x − 27. The triangle is:
(1) acute and scalene   (3) isosceles and acute
(2) right and acute   (4) obtuse and isosceles

7(15)+9 = 114   has an angle more than 90°
2(15)+3 = 33   has 2 congruent angles
4(15)-27 = 33

$7x+9+2x+3+4x-27=180°$
$13x-15=180$
$+15 \quad +15 \qquad x=15$
$\dfrac{13x=195}{13} \quad \dfrac{}{13}$

7. In △ABC, m∠A = 3x + 1, m∠B = 4x − 17, and m∠C = 5x − 20. Which type of triangle is △ABC?
1) right
2) scalene
3) isosceles
4) equilateral

two angles are
the same

$3x+1+4x-17+5x-20=180$
$12x-36=180$
$+36 \quad +36$
$\dfrac{12x=216}{12} \quad \dfrac{}{12}$
$x=18$

$3(18)+1=55$
$4(18)-17=55$
$5(18)-20=70$

8. Triangle PQR has angles in the ratio of 2 : 3 : 5. Which type of triangle is △PQR?
1) acute
2) isosceles
3) obtuse
4) right

has a 90° angle

$2x+3x+5x=180$
$\dfrac{10x=180}{10} \quad \dfrac{}{10}$
$x=18$

$2(18)=36$
$3(18)=54$
$5(18)=90$