Solve each of the following triangles.

1. $a = 10 \quad b = 12 \quad \alpha = 32°$

2. $a = 7 \quad b = 9 \quad \alpha = 114°$

3. $a = 22 \quad b = 23 \quad c = 27$

4. $a = 12 \quad b = 31 \quad \alpha = 21°$

5. $a = 15 \quad b = 25 \quad \alpha = 85°$

6. $a = 123.4 \quad b = 24.7 \quad \beta = 19.1°$

7. $a = 14 \quad b = 9 \quad \alpha = 139°$

8. How many triangles are there with the data given?

   (a) $\alpha = 30° \quad b = 8 \quad a = 3$
   (b) $\alpha = 30° \quad b = 8 \quad a = 4$
   (c) $\alpha = 30° \quad b = 8 \quad a = 5$
   (d) $\alpha = 30° \quad b = 8 \quad a = 9$

Answers

Solve each of the following triangles.

1. $a = 10 \quad b = 12 \quad \alpha = 32°$
   $\beta_1 = 39.487°, \quad \gamma_1 = 108.513°, \quad c_1 = 17.894$
   $\beta_2 = 140.513°, \quad \gamma_2 = 7.487°, \quad c_2 = 2.459$

2. $a = 7 \quad b = 9 \quad \alpha = 114°$ no solution

3. $a = 22 \quad b = 23 \quad c = 27 \quad \alpha = 51.4507°, \quad \beta = 54.8473°, \quad \gamma = 73.702°$

4. $a = 12 \quad b = 31 \quad \alpha = 21°$
   $\beta_1 = 67.787°, \quad \gamma_1 = 91.213°, \quad c_1 = 33.478$
   $\beta_2 = 112.213°, \quad \gamma_2 = 46.787°, \quad c_2 = 24.404$

5. $a = 15 \quad b = 25 \quad \alpha = 85°$ no solution

6. $a = 123.4 \quad b = 24.7 \quad \beta = 19.1°$ no solution

7. $a = 14 \quad b = 9 \quad \alpha = 139° \quad \beta = 24.945°, \quad \gamma = 16.055°, \quad c = 5.902$

8. How many triangles are there with the data given?

   (a) $\alpha = 30° \quad b = 8 \quad a = 3$ 0   triangle
   (b) $\alpha = 30° \quad b = 8 \quad a = 4$ 1   triangle
   (c) $\alpha = 30° \quad b = 8 \quad a = 5$ 2   triangles
   (d) $\alpha = 30° \quad b = 8 \quad a = 9$ 1   triangle