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#Jenny



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#Markus Jensen



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so many fake sites. this is the first one which worked! Many thanks

Right Triangles: Finding sides and angles (without a calculator)

SOLUTIONS

1) $X = 3$ because 3-4-5 special triangle

using pythagorean theorem: $6^2 + Y^2 = 10^2$
 $36 + Y^2 = 100$
 $Y = \sqrt{64}$

$Z = 30$ because 30-72-78 is 6 x (5-12-13) triangle. OR, using pythagorean theorem: $78^2 - 72^2 = 2^2 \cdot 2^2 \cdot 3^2$

2) 45-45-90 triangle therefore, $X = 14\sqrt{2}$
Or, $X = \sqrt{196 - 196} = 14\sqrt{2}$

30-60-90 triangle $Z = 5, X = 10$
 $Y = 5\sqrt{3}$
To check answer, try $5^2 + 5\sqrt{3}^2 = 10^2$
pythagorean theorem $100 = 100$

Since the hypotenuse is 2x one of the legs, we can conclude it is a 30-60-90 triangle. Therefore, angle b is 60 degrees. And, side W is $6/\sqrt{3}$

3) Find the altitude of equilateral $\triangle abc$
An equilateral triangle has angles of 60-60-60. This is helpful, since the altitude produces two 30-60-90 triangles.
 $h = 4\sqrt{3}$

Find the area of the above trapezoid
Area Trapezoid = $\frac{1}{2}(b_1 + b_2)h$
base 1 = 6
base 2 = 10 + 4 = 14
To find height, we consider the 30-60-90 right triangle.
 \rightarrow height = $4\sqrt{3}$
Area of Trapezoid = $\frac{1}{2}(10 + 14)4\sqrt{3} = 56\sqrt{3}$

Given the diagonal is 20. Find the area of the above rectangle.
We know the diagonal (hypotenuse) and the angle formed by the diagonal.
 30-60-90 triangle (knows the sides of rectangle)
Area of rectangle is length x width = $10 \times 10\sqrt{3} = 100\sqrt{3}$

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