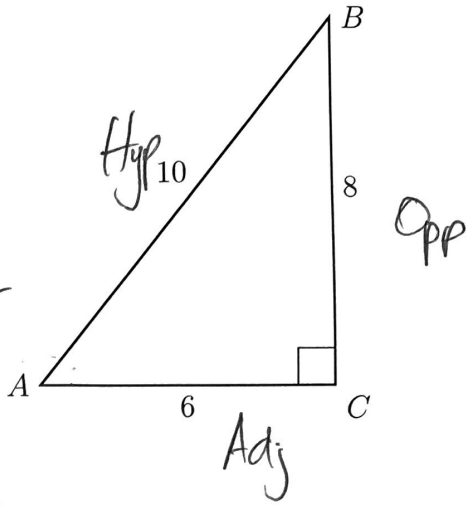
BECA / Dr Huson / 10th Grade Geometry
Unit 12 IB Trigonometry
27 May 2022

Name: Solutions

12.5 End of Unit Test **HSG.SRT.D.11**

1. Right triangle $\triangle ABC$ is shown with side lengths marked.



   (a) Which length is the hypotenuse? 10

   (b) Which length is *opposite* angle A? 8

   (c) Which length is *adjacent* to angle A? 6

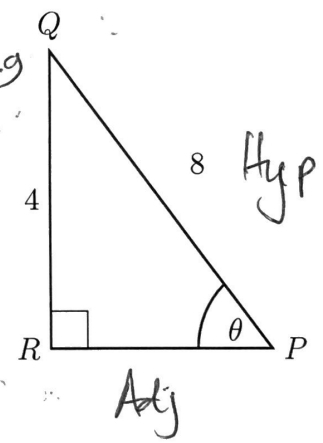
   (d) What is the area of the triangle?

$$A = \tfrac{1}{2}bh = \tfrac{1}{2}(6)(8) = 24$$

   (e) What fraction describes $\cos A$?

$$\cos A = \frac{\text{Adj}}{\text{Hyp}} = \frac{6}{10}$$

2. Right triangle $\triangle PQR$ is shown with side lengths marked.



   (a) Calculate the length PR. $a^2 + 4^2 = 8^2$
$\Rightarrow a = \sqrt{48} = 4\sqrt{3} \approx 6.9$

   (b) What fraction is $\sin\theta$? $4/8 = 1/2$

   (c) What fraction is $\cos\theta$? $\frac{4\sqrt{3}}{8} = \frac{\sqrt{3}}{2} = 0.866$

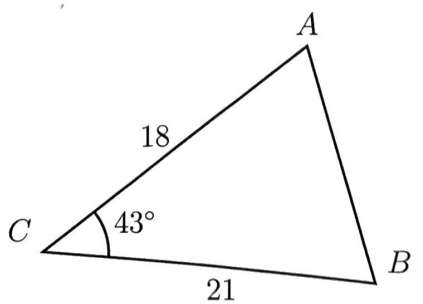
   (d) What fraction is $\tan\theta$? $\frac{4}{4\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

   (e) Which function of θ is $\frac{4}{8}$? (tan, sin, or cos) $\sin\theta$

   (f) Find the area of the triangle.

$$A = \tfrac{1}{2}bh = \tfrac{1}{2}(4\sqrt{3})(4) = 8\sqrt{3} \approx 13.86$$

3. Find the area of the given triangle.

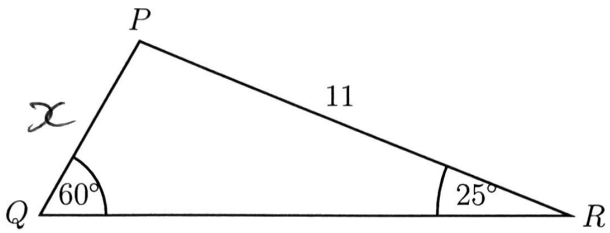


$$A = \tfrac{1}{2}ab\sin C$$
$$= \tfrac{1}{2}(18)(21)\sin 43^\circ$$
$$= 128.89\ldots$$
$$\approx 128.9$$

4. The following diagram shows triangle PQR, with $P\hat{Q}R = 60°$, $P\hat{R}Q = 25°$, and $PR = 11$.

   Find PQ.

   diagram not to scale



Sine Rule

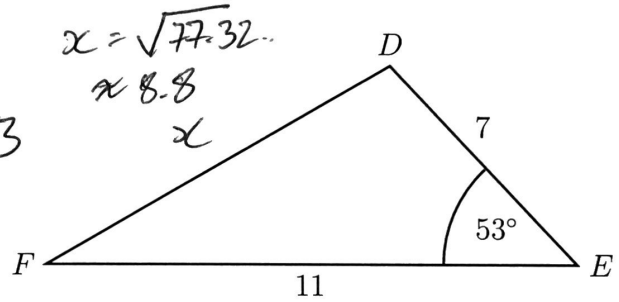
$$\frac{x}{\sin 25} = \frac{11}{\sin 60}$$

$$\Rightarrow x = 11 \cdot \frac{\sin 25}{\sin 60}$$

$$= 5.36\ldots \approx 5.37$$

5. The following diagram shows triangle DEF, with $DE = 7$, $D\hat{E}F = 53°$, and $EF = 11$.

   diagram not to scale



Cosine Rule

(a) Find DF.

$$x^2 = a^2 + b^2 - 2ab\cos 53$$
$$= 7^2 + 11^2 - 2(7)(11)\cos 53$$
$$= 77.32\ldots$$

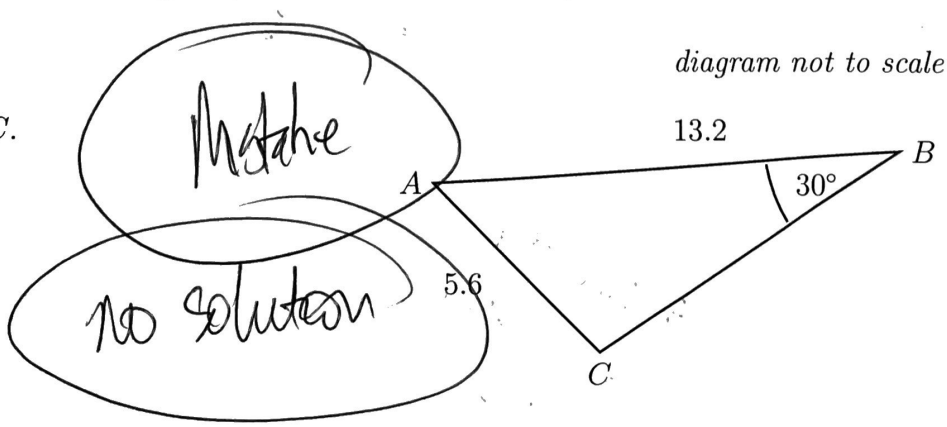
$$x = \sqrt{77.32\ldots}$$
$$x \approx 8.8$$
$$x$$

(b) What is the area of the triangle?

$$A = \tfrac{1}{2}ab\sin C$$
$$= \tfrac{1}{2}(7)(11)\sin 53$$
$$\approx 30.75$$

6. Triangle ABC has side lengths $AB = 13.2$ and $AC = 5.6$, while $A\hat{B}C = 30°$.

   diagram not to scale



Mistake

No solution

(a) Find $\sin C$.

(b) Find $\angle C$.