

IGP

Wilson

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1. Consider $\triangle ABC$ with $AB = 13$, $BC = 15$, $CA = 14$. If M is the midpoint of AB and P is a point on AC such that $MP \perp AC$, find MP . (*W2b*)
2. Prove $[ABC] = \frac{1}{2}ab \sin C$. (*1.4*)
3. If triangle PQR has sides 40, 60, and 80, then the shortest altitude is K times the longest altitude. Find the value of K . (*2.4*)
4. Find
$$\frac{1}{1 \cdot (1+2)} + \frac{1}{2 \cdot (2+2)} + \cdots + \frac{1}{21 \cdot (21+2)}$$
rounded to the nearest integer. (*3.2*)
5. Find the number of subsets of $\{1, 2, 3, 4, 5, 6, 7, 8\}$ that are subsets of neither $\{1, 2, 3, 4, 5\}$ nor $\{4, 5, 6, 7, 8\}$. (*4.3*)