IGP

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1. Consider $\triangle ABC$ with $AB = 13, BC = 15, CA = 14$. If M is the midpoint of BC and P is a point on AC such that $MP \perp AC$, find MP. *(W2a)*

2. A triangle has side lengths 4 and 8, and it has an area of $3\sqrt{15}$. Find the possible lengths of the third side. *(1.6)*

3. Find the length of the altitude to the 14 inch side of a triangle whose two other sides have lengths of 13 inches and 15 inches. *(1.7)*

4. The sides of $\triangle BAC$ are in the ratio $2 : 3 : 4$. BD is the angle bisector drawn to the shortest side AC, dividing it into segments AD and CD. If the length of AC is 10, then find the length of the longer segment of AC. *(2.3)*

5. 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)*

6. Find the probability the product of the bottom face of 3 dice is composite. *(4.2)*