

48. (A) Let $F = \frac{2 \sin P - \sin 2P}{2 \sin P + \sin 2P}$

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Let PQR ---- = $\frac{2 \sin P (1 - \cos P)}{2 \sin P (1 + \cos P)}$

$$= \tan^2 \frac{P}{2} = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$$

$$2s = 2 + \frac{7}{2} + \frac{5}{2} = \sqrt{\frac{(4 - \frac{7}{2})(4 - \frac{5}{2})}{4 \cdot (4 - 2)}}$$

$$2s = 8$$

$$s = 4$$

$$\Delta = \sqrt{4(4-2)(4-\frac{7}{2})(4-\frac{5}{2})} = \sqrt{\frac{\frac{1}{2} \cdot \frac{3}{2}}{4 \cdot 2}} = \sqrt{\frac{3}{16 \cdot 2}}$$

$$= \frac{\sqrt{3}}{4\sqrt{2}} = \frac{3}{4\sqrt{6}}$$

$$= \sqrt{4 \cdot 2 \cdot \frac{1}{2} \cdot \frac{3}{2}} = \sqrt{\frac{12}{2}} = \sqrt{6}$$

$$4\Delta = 4\sqrt{6}$$

$$F = \frac{3}{4\Delta}$$

45. (D) $\frac{1}{a_1}, \frac{1}{a_2}, \frac{1}{a_3}, \dots, \frac{1}{a_n} \rightarrow AP$

$$\frac{1}{25} = \frac{1}{5} + 19d \rightarrow 19d = \frac{1}{25} - \frac{1}{5} = \frac{1-5}{25} = \frac{-4}{25}$$

$$d = \frac{-4}{19 \cdot 25}$$

$$\frac{1}{a_n} = \frac{1}{5} + (1-n) \frac{4}{19 \cdot 25} < 0$$

$$1 + \frac{(1-n)4}{95} < 0$$

$$(1-n) < \frac{-95}{4}$$

$$n-1 > \frac{95}{4}$$

$$n > 24.75 \rightarrow n = 25$$