

2. If x is a number between 4 and 8 and y is a number between 20 and 40, what are the smallest and largest possible values of $\frac{y}{x}$?

¹Some of the problems here come from T. Gagen, Uni. of Syd. and from E. Szekeres, Macquarie Uni.

1

$$+ b^2) = c^2 + 4h^2:$$

theorem.

Knowing only the lengths of the three medians, k (or find a better way.)

are externally tangent at the point P . A straight line is drawn through P intersecting the circles respectively at A and B . Show that the tangents to the circles at A and B are perpendicular.

(Find the last three digits) of $1! + 2! + 3! + \dots + 99!$.

and the bottom by $A_1; B_1; C_1; D_1$

deduce that these points form the vertices of a regular hexagon.

5. A quadrilateral in which a circle can be drawn which touches each of the four sides is called a circumscribable quadrilateral. If r is the radius of the circle and s is half the perimeter of the quadrilateral, prove that the area of the quadrilateral is rs .
6. What is the smaller angle between the hands of the clock at 12:25pm?

Senior Questions

1. Solve the equation $\cot^{-1} x + \cot^{-1}(x + 2) = \frac{\pi}{4}$