5. If an angle of a triangle be bisected by a straight line, which likewise cuts the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the segments of the base, together with the square on the straight line bisecting the angle. (25)

Algebra.

1. Resolve into factors :—

(*a*), $x^6 - y^6$, (3)

(*b*), $a^2 + 9ab + 20b^2$; (3)

(*c*), $(a + b)^2 - 11c(a + b) + 30c^2$. (3)

2. Write down the values of :—

(*a*) $\dfrac{x^3 + y^3}{x + y}$ (3)

(*b*) $\dfrac{x^7 - y^7}{x - y}$ (3)

(*c*) $\dfrac{x^4 - y^4}{x + y}$ (3)

3. Find the value of :—

(*a*) $\dfrac{1 + 3x}{1 - 3x} - \dfrac{1 - 3x}{1 + 3x}$ (5)

(*b*) $\dfrac{1}{(a - b)(a - c)} + \dfrac{1}{(b - a)(b - c)} + \dfrac{1}{(c - a)(c - b)}$ (8)

4. Solve the equations :—

(*a*) $\dfrac{42}{x - 2} = \dfrac{35}{x - 3}$ (5)

(*b*) $\sqrt{4x} + \sqrt{4x - 7} = 7$ (8)

(*c*) $\begin{cases} x - y = 3 \\ x^2 + y^2 = 65 \end{cases}$ (12)

5. (1) Solve the equation :—

$x^2 + px + q = 0$ (10).

(2) and show when there are

(1) two equal roots,

(2) two possible rooots,

(3) two impossible roots. (10)

(3) When a quadratic equation is reduced to the form $x^2 + px + q = 0$, show that the sum of the roots is equal to the co-efficient of the second term with its sign changed, and the product of the roots is equal to the last term. 10)

6. A certain number consists of two digits. The left hand digit is double of the right hand digit, and if the digits be inverted the product of the number thus formed and the original number is 2268. Find the number. (14)