

## TRIGONOMETRY , GEOMETRY & ALGEBRA

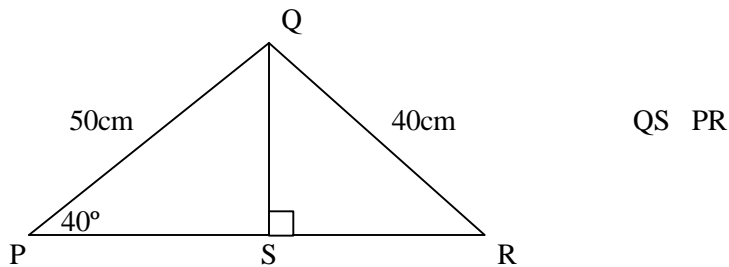
1 Transpose following formulae to make 'X' the subject.

- (i)  $S = (A+X)t$     (ii)  $U = kX^2 + 5/U$     (iii)  $P = kX / (X+P)$     (iv)  $k(X^2+X) = (X^2-1) / (X-1)$   
 (v)  $Y = mX + c$     (vi)  $Y = AX^2+B$     (vii)  $L = (X+2) / (X^2-4)$     (viii)  $X = 5X+c$

2. Some of the data about the triangle ABC is given below .Find the remaining angles and sides of each of the following triangles.

- (i)  $A = 50^\circ$  ,  $B = 75^\circ$  ,  $a = 27\text{cm}$  . Find C , c and b .  
 (ii)  $a = 15\text{cm}$  ,  $b = 26\text{ cm}$  ,  $c = 30\text{cm}$ . Find A,B and C.  
 (iii)  $A = 100^\circ$  ,  $b = 3\text{m}$  ,  $c = 1.8\text{m}$ . Find a , B and C.  
 (iv)  $A = 30^\circ$  ,  $B = 80^\circ$ . Find C and the ratio a:b:c.  
 (v)  $A = 50^\circ$  ,  $B = 75^\circ$  ,  $c = 20\text{m}$  . Find C , a and b .

3.



Find QS , PS , SR , PR and .

4. The kinetic energy(E) of an object with mass(m) and the speed is given by

$$E = \frac{1}{2} m v^2$$

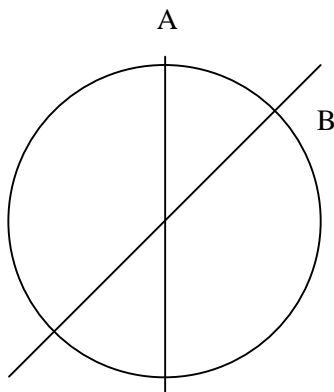
- (i) Transpose this formula to make 'v' the subject.  
 (ii) Hence find the speed of an object having the mass of 5kg and the kinetic energy of 500J.

5. A body oscillates with simple harmonic motion according to the equation

$$x = 6.0 \cos(3 t + \pi/3)$$

Transpose this formula to make 't' the subject. Hence find t when  $x = 3.0$ .

6.



The circle has the radius of 5cm. Find the area of the sector AOB.

7. Solve following pairs of simultaneous equations by substitution

- (i)  $2x + 3 = 8$  ,  $x - 3y = 15$
- (ii)  $x - 15 = 3y$  ,  $x + y = 8$
- (iii)  $x - y = 4(x + y)$  ,  $y = 3x + 8$
- (iv)  $y = 3x + 2$  ,  $y = 2x + 3$
- (v)  $+ = 5$  ,  $- = 2$

8. Solve following pairs of simultaneous equations by elimination.

- (i)  $x - y = 8$  ,  $x + y = 15$
- (ii)  $x + y = 0$  ,  $xy = 11$
- (iii)  $a = 3b$  ,  $a + b = 8$
- (iv)  $5V = 3(I + 8)$  ,  $V + 4I = 2$
- (v)  $x^2 - y^2 = 5(x + y)$  ,  $x + y = 7$

9. Factorize the following expressions.

- (i)  $x^2 - 4$
- (ii)  $a^3 - b^3$
- (iii)  $x^3 + y^3$
- (iv)  $x^3 - 9x$
- (v)  $x^2 + x - 6$
- (vi)  $z^2 + 11z + 30$
- (vii)  $6x^2 + 5x + 1$
- (viii)  $x^2 + 3xy + 2y^2$
- (ix)  $xy^3 - yx^3$
- (x)  $x^2 - 3x - 8$

10. Solve the following quadratic equations by factorization

- (i)  $x^2 = 6x - 5$
- (ii)  $3x^2 + 10x + 3 = 0$
- (iii)  $y^2 = 4y - 4$
- (iv)  $R^2 = 7R$
- (v)  $aX^2 + bX + c = 0$  ; ( here solve the equation to find X in terms of a, b & c )

11. Solve the following quadratic equations by using formula.

- (i)  $x^2 + 3x - 15 = 0$
- (ii)  $2x^2 - 3x = 10$
- (iii)  $(x + 3)^2 = (2x - 1)^2$
- (iv)  $R + 3 = 1 / (R - 4)$
- (v)  $V^3 = 3V^2 + 8V$

12. The arc length AB is equal to the radius of the circle. Find the angle subtended by the arc AB in degrees.

13. The physical quantities P and Q are related by  $P = aQ + b$  , where a and b are constants. Find a and b given that  $P = 8$  when  $Q = 2$  and  $P = 4$  when  $Q = 4$ .

14. The equation of a straight line is given by  $y = mx + c$  . When  $x = 0$  ,  $y = 8$  and when  $y = 0$  ,  $x = 5$ . Find m and c.

15. Find the area of the equilateral triangle ABC , given that  $a = b = c = 15\text{cm}$ .