**S4 SUBSIDIARY MATHEMATICS WORK (PCB)**

1. Convert: a) 400 into radians leaving 𝜋 in your answer

 b) 35 𝜋 into degrees

2. a) Given that sin 𝑎 = 0.6 and that 𝑎 lies in the first quadrant; determine the exact value of cos 𝑎 and tan 𝑎.

b) If tan 𝜃 = − 45 and that 𝜃 belongs to the 4th quadrant, determine the exact value of sin 𝜃 and that of cos 𝜃.

3. Find the area of a triangle whose measures are: a) a=5cm; b=8cm and C=300

 b) a=10cm; b=9cm and c=12cm

4. Solve the following equations:

a. 2𝑥 + 3 = 4 − 𝑥

b. |4𝑥 − 3| = 5

c. |5𝑥 + 1| = 2 + 𝑥

d. 81−𝑥 =42𝑥+3

e. 24−𝑥 = 5

5. Construct a Cayley table for addition modulo 7;(ℤ7, +) And give inverse element of 5.

6. Write as a single logarithm in the form log a, a ∈ ℝ, a) log 5 + log 6 b) 3 log 2 – 5 log 7

7. Rationalize the denominators of the following numbers.

 a. $\frac{2}{3\sqrt{5}}$ b. $\frac{\sqrt{3}}{2-\sqrt{3}}$

8. If a vertical stick 12 m long casts a shadow 8 m long on the ground and at the same time a tower casts a shadow 40 m long on the ground, then the height of the tower is:

(a) 40 m (c) 50 m (C) 75 m (d) 60 m

9. Prove the following trigonometric identities:

 a) 

 b) 

 c) 

 d) 

10. If  and , then prove that

