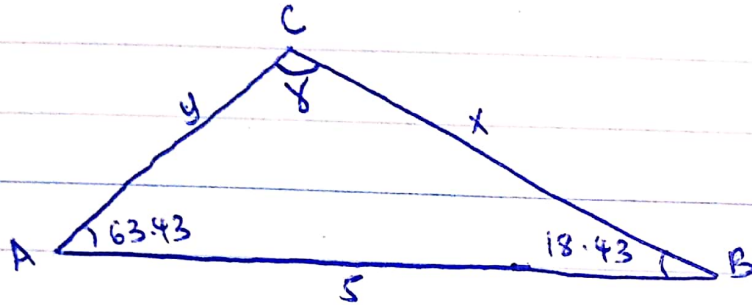


1.



$$\alpha = \tan^{-1}(2) = 63.43^\circ$$

$$\beta = \tan^{-1}(1/3) = 18.43^\circ$$

$$\gamma = 180 - (63.43 + 18.43) = 98.14$$

$$\frac{\sin \gamma}{a} = \frac{\sin \alpha}{x}$$

$$\frac{\sin(98.14)}{5} = \frac{\sin(63.43)}{x}$$

$$x = \frac{\sin(63.43)}{\sin(98.14)} \times 5 = 4.52$$

$$\frac{\sin \gamma}{a} = \frac{\sin \beta}{y}$$

$$\frac{\sin(98.14)}{5} = \frac{\sin(18.43)}{y}$$

$$y = \frac{\sin(18.43)}{\sin(98.14)} \times 5 = 1.60$$

$$2.(a) \quad 3e^{2x} + e^x - 2 = 0$$

$$3(e^x)^2 + e^x - 2 = 0$$

$$\text{Let } e^x = y$$

$$3y^2 + y - 2 = 0$$

$$3y^2 + 3y - 2y - 2 = 0$$

$$3y(y+1) - 2(y+1) = 0$$

$$(3y-2)(y+1) = 0$$

$$3y-2=0 \quad \text{or} \quad y+1=0$$

$$y = \frac{2}{3}$$

$$y = -1$$

$$e^x = \frac{2}{3}$$

$$\text{or } e^x = -1 \text{ (False)}$$

$$x = \ln\left(\frac{2}{3}\right)$$

$$(b) \quad n(\lambda) = 1$$

$$3. \quad e^{-2x} < e$$

$$\frac{-2x}{-2} < \frac{1}{-2}$$

$$x > -\frac{1}{2}$$

$$\text{Interval} = (-\frac{1}{2}, \infty)$$

$$4. \quad 2^{2x} = 9$$

(a)

$$\ln(2^{2x}) = \ln(9)$$

$$2x \ln(2) = \ln(9)$$

$$x = \frac{\ln(9)}{2 \ln(2)} = \frac{\ln(3^2)}{2 \ln(2)} = \frac{\ln(3)}{\ln(2)}$$

$$(b) \quad n(\Lambda) = 1$$