

Question one

$$a) i) \frac{3x-1}{5} = 6x+5 \quad \times 5$$

$$9(3x-1) = 5(6x+5)$$

$$27x-9 = 30x+25$$

$$27x-30x = 25+9$$

$$-3x = 34$$

$$x = -\frac{34}{3}$$

$$ii) \frac{1+\frac{5}{x}}{x^2+5x} = -6$$

$$x^2+5x = -6$$

$$x^2+5x+6 = 0$$

$$(x+2)(x+3) = 0$$

$$iii) 2 \log(3x+1) = \log(x+3) + \log(x+7)$$

$$(3x+1)^2 = (x+3)(x+7)$$

$$x - x = \frac{1+\sqrt{41}}{4} \quad x = \frac{1-\sqrt{41}}{4}$$

$$x = \frac{1+\sqrt{41}}{4}$$