

M102 #9 SOLUTIONS

1 a) CAN'T DIVIDE BY ZERO:

$$4 - 3x^2 \neq 0$$

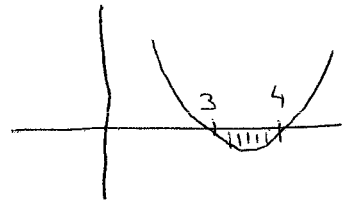
$$4 \neq 3x^2 \Rightarrow \text{DOMAIN ALL } x, \text{ EXCEPT } x \neq \pm \sqrt{\frac{4}{3}}$$

b) NEED POSITIVE INSIDE LOGARITHM:

$$7x - 12 - x^2 > 0$$

$$x^2 - 7x + 12 < 0$$

$$(x-4)(x-3) < 0$$



DOMAIN ALL $3 < x < 4$

2. FACTOR $x^2(x^3 - 3x^2 - 5x + 15) = 0$

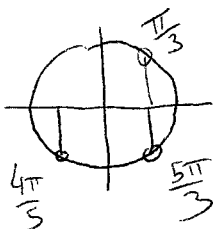
↳ $x=3$ IS A SOLUTION,
SO FACTOR OUT $(x-3)$

$$x-3 \overline{) x^3 - 3x^2 - 5x + 15} = x^2 - 5$$

HENCE FACTOR AS $x^2(x-3)(x^2-5) = 0$

SOLUTIONS ARE $x=0$, $x=3$, $x=+\sqrt{5}$, $x=-\sqrt{5}$

3. SOLVE $\sin x = -\frac{\sqrt{3}}{2} \Rightarrow x = \frac{4\pi}{3}$ AND $x = \frac{5\pi}{3}$



SO $2\sin x + \sqrt{3} < 0$

FOR $\frac{4\pi}{3} < x < \frac{5\pi}{3}$