

Nov 11th 2020

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Question 1

$$v_{min} = 200 \quad [s]$$

$$\omega = 490332$$

$$p = 0.41$$

$$c_L = 0.52$$

$$\omega) v_{min} = \sqrt{\frac{\omega}{s} \times \frac{2}{p} \times \frac{1}{c_L}}$$

$$v_{min}^2 = \frac{\omega}{s} \times \frac{2}{p} \times \frac{1}{c_L}$$

$$v_{min}^2 (s \times p \times c_L) = \omega \times 2 \times 1$$

$$v_{min}^2 s \times v_{min}^2 p \times v_{min}^2 c_L = \omega \times 2 \times 1$$

$$v_{min}^2 s = \frac{\omega \times 2 \times 1}{(v_{min}^2 p \times v_{min}^2 c_L)}$$

$$\left(\frac{\sqrt{\frac{490332 \times 2 \times 1}{200^4 (0.41 \times 0.52)}}}{200} \right)$$

$$v_{min} s = \sqrt{\frac{\omega \times 2 \times 1}{v_{min}^2 p \times v_{min}^2 c_L}}$$

$$\left(\frac{\sqrt{\frac{980664}{303456000000}}}{200} \right)$$

$$s = \frac{\left(\sqrt{\frac{\omega \times 2 \times 1}{(v_{min}^2 p) \times (v_{min}^2 c_L)}} \right)}{v_{min}}$$

$$s = 1.465 \times 10^{-6}$$

$$s = \left(\frac{\sqrt{\frac{\omega \times 2 \times 1}{v_{min}^4 (p \times c_L)}}}{v_{min}} \right)$$

$$6) 1) \frac{8x-3}{5} = \frac{-5x+6}{-3}$$

$$-3(8x-3) = -3(-5x+6)$$

(F(12))

$$-24x+9 = 15x-18$$

$$15x+24x = -18-9$$

$$39x = -27$$

$$\frac{-27}{39} \rightarrow x = 1.4$$

$$2) \frac{(4x-1)}{3} - \frac{x}{4} = \frac{(4x+13)}{2}$$

$$4(4x-1) - 3(x) = 6(4x+13)$$

$$16x-4-3x = 24x+78$$

$$13x-4 = 24x+78$$

$$-4-78 = 24x-13x$$

$$-82 = 11x$$

$$-7 = 11x$$

$$\frac{-7}{11} \rightarrow x = 0.63$$

$$3) 2\log(5x+3) = \log(x+1) + \log(x+2)$$

$$\log(5x+3)^2 = \log(x+1)(x+2)$$

(3rd law)

(1st law)

$$(5x+3)(5x+3) = (x+1)(x+2)$$

$$5x^2+15x+15x+9 = x^2+2x+x+2$$

$$\frac{4x^2}{A} + \frac{12x}{6} + \frac{7}{c}$$

$$x = 0 \pm \frac{\sqrt{(b)^2 - 4(ac)}}{2 \times a}$$

$$x = -12 \pm \frac{\sqrt{32}}{8}$$

$$x = -\frac{12}{4} \pm \frac{\sqrt{(12)^2 - 4(4 \times 7)}}{2 \times 4}$$

$$x = -12 \pm \frac{5.657}{8}$$

$$x = -12 \pm \frac{\sqrt{144 - 112}}{8}$$

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$$x = \frac{6.343}{8}$$

$$x = \frac{-17.657}{8}$$

$$x = 0.792$$

$$x = -2.207$$

$$4) 7^x \times 3^{x+2} = 5^{x-1}$$

$$\log 7^x + \log 3^{x+2} = \log 5^{x-1}$$

$\uparrow$ 3rd line $\nwarrow$ 3rd line

$$(x) 0.845 + (x+2) 0.477 = (x-1) 0.699$$

$\log$ $\log$ $\log$

$$(0.845x)(0.477x + 0.954) = (0.699x - 0.699)$$

$$0.403x^2 + 0.806x = 0.699x - 0.699$$

$$\frac{0.403x^2}{A} + \frac{0.107x}{B} = \frac{-0.699}{C}$$

$$x = -0.107 \pm \frac{\sqrt{(0.107)^2 - 4(0.403 \times -6.99)}}{2 \times 0.403}$$

$$x = -0.107 \pm \frac{\sqrt{0.0114 - 1.127}}{0.806}$$

$$x = -0.107 \pm \frac{\sqrt{1.138}}{0.806} \quad x = -0.107 \pm \frac{\sqrt{1.067}}{0.806}$$

$$x = -0.107 \pm \frac{1.067}{0.806}$$

$$x = \frac{0.96}{0.806}$$

$$x = \frac{-1.174}{0.806}$$

$$x = 1.191$$

$$x = -1.457$$

c) $21x^2 + 24x + 5$

Question 3

a) $12x^2 = 31x + 15$

$$x = \frac{-31 \pm \sqrt{(-31)^2 - 4(12)(-15)}}{2 \times 12}$$

$$\frac{12x^2}{4} - \frac{31x}{8} - \frac{15}{4}$$

$$x = \frac{31 \pm \sqrt{961 - 1720}}{24}$$

$$x = \frac{31 \pm \sqrt{1681}}{24}$$

$$x = \frac{31 \pm (41)}{24}$$

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$$x = \frac{72}{24}$$

$$x = 3$$

$$x = \frac{-10}{24}$$

$$x = \frac{-0.42}{24}$$

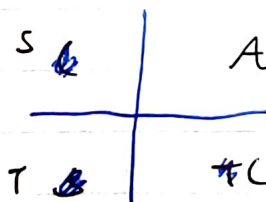
b) $0^\circ < 360^\circ$

1) $\cos x = 0.62$

$$\cos^{-1} = 51.683^\circ$$

$$- 360^\circ \rightarrow$$

$$= 308.317^\circ$$



2) $7 \sin x = 4$

$$\frac{4}{7} = 0.571 \quad x = \sin^{-1} = 34.820^\circ - 180^\circ$$

$$x = 145.180^\circ$$

3) $-5 \tan x = 4$

$$\frac{4}{-5} = -0.8 \quad x = \tan^{-1} = 38.660^\circ - 270^\circ$$

$$x = 231.34^\circ$$

$$4) -3 \sin x = -2 \quad \frac{-2}{-3} = 0.6 \quad x = \sin^{-1} = 41.810 - 180$$

$$x = 138.190$$

$$c) \underline{x^2 + 3x + 10}$$

$$0^\circ < 360^\circ$$

$$(x+2)(x+5) \leftarrow (2 \times 5)$$

$$\tan x + 3x - 10 = 0$$

$$\cancel{x+2} \cancel{x+5}$$

$$(x+2)(-3x+10)$$

$$(x^2 - 5x + 2x + 10)$$

$$x = \frac{-3 \pm \sqrt{(-3)^2 - 4(1)(10)}}{2 \times 1}$$

$$x = \frac{-3 \pm \sqrt{9 - 40}}{2}$$

$$x = \frac{-3 \pm \sqrt{-31}}{2} \quad x = \frac{-3 \pm 5.568}{2}$$

$$x = \frac{-3.568}{2}$$

$$x = \frac{2.568}{2}$$

$$x = 1.284$$

$$x = 4.284$$

$$\tan x + 3x(1.284 // 4.284) = 10$$

$$3 \times 1.284 = 3.852$$

$$3 \times 4.284 = 12.852$$

$$x = \tan^{-1}(\frac{1.285}{3.852}) = 18.11$$

$$x = 217.89$$

$$(-270)$$

$$x = \tan^{-1}(0.385) = 21.057$$

$$x = 248.943$$

$$(-270)$$

$$d) y = \sin^2\left(\frac{3\theta}{2}\right)$$

$[\theta]$

$$\sqrt{y} = \sin\left(\frac{3\theta}{2}\right) \quad \frac{\sqrt{y}}{2\sin} = 3\theta$$

$$3\left(\frac{\sqrt{y}}{2\sin}\right) = y$$