

Time: 15:50
Date: 3/11/2020
Module code: ACHA3000
Student ID: 2005263

$$(Q4) \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\begin{matrix} a & b & c \\ 14x^2 + 3x - 11 = 0 \end{matrix}$$

$$x = \frac{-3 \pm \sqrt{3^2 - 4(14)(-11)}}{2(14)}$$

$$x = \frac{-3 \pm \sqrt{9 + 616}}{28}$$

$$x = \frac{-3 \pm \sqrt{625}}{28}$$

$$x = \frac{-3 \pm 25}{28}$$

$$x = \frac{-3 + 25}{28}$$

$$x = \frac{11}{14}$$

$$x = 0.79$$

$$x = \frac{-3 - 25}{28}$$

$$x = -1$$

$$Q5) \quad 5x + 3y = 39 \quad (i)$$

$$8x - 2y = 42 \quad (ii)$$

$$10x + 6y = 78 \quad (iii)$$

$$24x - 6y = 126 \quad (iv)$$

$$34x = 204$$

$$x = \frac{204}{34}$$

$$x = 6$$

$$5(6) + 3y = 39$$

$$30 + 3y = 39$$

$$3y = 39 - 30$$

$$3y = 9$$

$$y = \frac{9}{3}$$

$$y = 3$$

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Q3) i) $x^2 + 10x + 21 = 0$
 $(x+3)(x+7) = 0$

$$x+3=0$$
$$x=-3$$

$$x+7=0$$
$$x=-7$$

ii) $x^2 - 3x + 2 = 0$
 $(x-1)(x-2) = 0$

$$x-1=0$$
$$x=1$$

$$x-2=0$$
$$x=2$$

iii) $x^2 + 12x + 20 = 0$
 $(x+2)(x+10) = 0$
 $x+2=0$ $x+10=0$
 $x=-2$ $x=-10$

iv) $x^2 - 64 = 0$
 $(x+8)(x-8) = 0$

$$x+8=0$$
$$x=-8$$

$$x-8=0$$
$$x=8$$

v) $2x^2 + 9x + 10 = 0$
 $(2x^2 + 4x + 5x + 10) = 0$
 $2x(x+2) + 5(x+2) = 0$

$$(x+2)(2x+5) = 0$$

$$x+2=0$$
$$x=-2$$

$$2x+5=0$$
$$x = -\frac{5}{2}$$

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Q1) i) $x^4 \times x^6 \times x = x^{11}$
ii) $2x^2 \times 3x^3 \times 2x = 12x^6$

iii) $\frac{x^4 \times x^3 \times x^2}{x^9} = \frac{x^9}{x^9} = 1$

iv) $(3x^2)^3 = 27x^6$

v) $\sqrt{x} \times \sqrt{x} = x^{\frac{1}{2}} \times x^{\frac{1}{2}} = x^1 = x$

Q2) i) $15x - 2 = 12x + 9$

$$15x - 12x = 9 + 2$$

$$3x = 11$$

$$x = \frac{11}{3}$$

ii) $3(7x - 1) = 6(x + 3)$

$$21x - 3 = 6x + 18$$

$$21x - 6x = 18 + 3$$

$$15x = 21$$

$$x = \frac{21}{15} \div 3$$

$$x = \frac{7}{5}$$

iii) $\frac{5x+3}{4} = \frac{2x-1}{9}$

$$9(5x+3) = 4(2x-1)$$

$$45x + 27 = 8x - 4$$

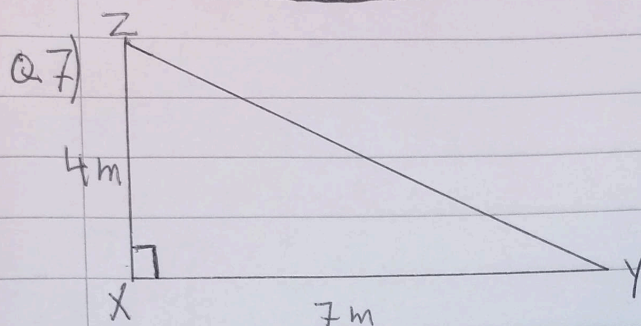
$$45x - 8x = -4 - 27$$

$$37x = -31$$

$$x = \frac{-31}{37}$$

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Q6) $S(2x^2 - y^2) - x^2(x^2 - y) - x^2y - x^4$
 $10x^2 - 5y^2 - x^4 + x^2y - x^2y - x^4$
 $(10x^2 - 5y^2 - 2x^4)$



50(HTA)

i) $\tan^{-1} \frac{4}{7} = \frac{4}{7}$
 $\theta = \tan^{-1} \left(\frac{4}{7} \right)$
 $\theta = 29.7449^\circ$

ii) $\angle Z = 180 - 90 - 29.7449$
 $\angle Z = 60.2551^\circ$

iii) $ZY^2 = 4^2 + 7^2$
 $ZY^2 = 16 + 49$
 $ZY^2 = 65$
 $ZY = \sqrt{65}$
 $ZY = 8.06 \text{ m}$

Q8) i) $\sqrt[3]{x} = x^{\frac{1}{3}}$

ii) $1 = x^0$