

03/11/2020

Barry Bradshaw 1909431

Time 15:00

Introduction to Mathematics and science

ACHA3000

$$\textcircled{i)} \textcircled{i)} x^4 \times x^6 \times x$$

$$4 + 6 + 1 = 11$$

$$= x^{11}$$

$$\textcircled{ii)} 2x^2 \times 3x^2 \times 2x$$

$$2 + 2 + 1 = 5$$

$$2 \times 3 \times 2 = 12$$

$$= 12x^5$$

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

$$4 + 3 + 2 = 9$$

$$9 - 9 = 0$$

$$\frac{x^9}{x^9} = 1$$

$$\textcircled{iv)} (3x^2)^3$$

$$3^3 (x^2)^3$$

$$3^3 = 27$$

$$27x^{2 \times 3}$$

$$27x^6$$

$$\textcircled{v)} \sqrt{x} \times \sqrt{x}$$

$$\sqrt{a} \times \sqrt{a} = a$$

$$= x$$

3/11/2020

time 15:00

Barry Bradshaw 1901431

Page 2/6

ACHA 3000

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

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

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

$$3x(-2) = 9$$

$$3x = 9 + 2$$

$$3x = 11$$

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

$$x = 3.667$$

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

$$3 \times 7x = 21x, \quad 3x - 1 = -3$$

$$6 \times x = 6x, \quad 6 \times 3 = 18$$

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

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

$$15x(-3) = 18$$

$$15x = 18 + 3$$

$$15x = 21$$

$$x = \frac{21}{15} = \frac{7}{5}$$

$$x = 1.4$$

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

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

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

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

$$37x + 27 = -4$$

$$37x = -4 - 27$$

$$37x = -31$$

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

$$x = -0.8378$$

03/11/2020

Barry Bradshaw 1909431

Page 31

Time 15:00

ACHC3000

8 i) $x^2 + 10x + 21 = 0$

$$(x+7)(x+3) = 0$$

$$x^2 + 3x + 7x + 21 = 0$$

$$x^2 + 10x + 21 = 0$$

$$x+7 = 0$$

$$x = 0 - 7$$

$$x = -7$$

$$x+3 = 0$$

$$x = 0 - 3$$

$$x = -3$$

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

~~$$x^2 - 1x - 2x + 2 = 0$$~~

$$x^2 - 1x - 2x + 2 = 0$$

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

$$x-2 = 0$$

$$x = 0 + 2$$

$$x = 2$$

$$x-1 = 0$$

$$x = 0 + 1$$

$$x = 1$$

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

$$x^2 + 2x + 10x + 20 = 0$$

$$x^2 + 12x + 20 = 0$$

$$x+10 = 0$$

$$x = 0 - 10$$

$$x = -10$$

$$x+2 = 0$$

$$x = 0 - 2$$

$$x = -2$$

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

$$x^2 + 8x - 8x - 64 = 0$$

$$x^2 - 64 = 0$$

$$x+8 = 0$$

$$x = 0 - 8$$

$$x = -8$$

$$x-8 = 0$$

$$x = 0 + 8$$

$$x = 8$$

$$\sqrt{64} = 8$$

$$+ 8x - 8x$$

$$= -64$$

03/11/2020
Time 15:00

Benny Bradshaw 1909431
ACHA 3000

Page 4/6

④ $14x^2 + 3x = 11$

$$14x^2 + 3x = \textcircled{11}$$

$$14x^2 + 3x - 11 = 0$$

$$\underline{14 = a} \quad \underline{3 = b} \quad \underline{-11 = c}$$

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

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

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

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

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

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

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

$$\cancel{x = -1}$$

$$x = 0.7857$$

03/11/2020

Time 15:00

Barry Bradshaw 1909431

Page 5/6

ACHA3000

$$\begin{aligned} 5) \quad 5x + 3y &= 39 \\ 8x - 2y &= 42 \end{aligned}$$

$$\begin{aligned} 5x + 3y &= 39 \\ 5(6) + 3y &= 39 \end{aligned}$$

$$\begin{aligned} 5x + 3y &= 39 \quad (\times 2) \\ 8x - 2y &= 42 \quad (\times 3) \end{aligned}$$

$$(30) + 3y = 39$$

$$\begin{aligned} 10x + 6y &= 78 \\ -24x + 6y &= -126 \end{aligned}$$

$$3y = 39 - 30$$

$$3y = 9$$

$$(34)x = 204$$

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

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

$$y = 3$$

$$x = 6$$

$$x = 6, y = 3$$

check

$$8x - 2y = 42$$

$$8(6) - 2(3) = 42$$

$$48 - 6 = 42$$

03/11/2020

Barry Bradshaw

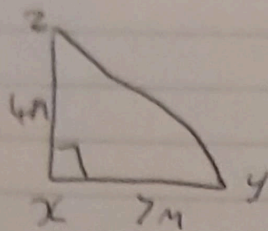
1909431

Page 6/6

Time 15:00

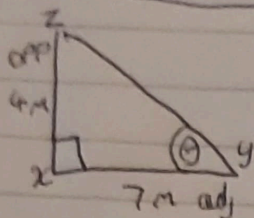
ACHA3000

7)



Soh Cah Toa

i)



$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

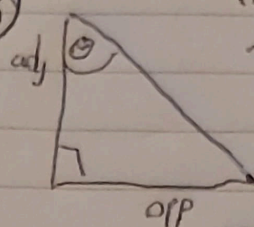
$$\theta = \tan^{-1}\left(\frac{\text{opp}}{\text{adj}}\right)$$

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

$$\theta = 29.74^\circ$$

$$\boxed{\theta = 29.74^\circ}$$

ii)



$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan \theta = \frac{7}{4}$$

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

$$\theta = 60.26^\circ$$

$$\boxed{\theta = 60.26^\circ}$$

iii)

$$a^2 + b^2 = c^2$$

$$4^2 + 7^2 = c^2$$

$$16 + 49 = 65$$

$$\sqrt{65} = 8.062 \text{ m}$$

$$\boxed{yz = 8.062 \text{ m}}$$

$$\textcircled{8} \text{ i) } \sqrt[3]{x} = x^{\frac{1}{3}}$$

$$\left(\sqrt[n]{a^m}\right) = a^{\frac{m}{n}}$$

$$\text{ii) } 1 = x^0$$

$$a^0 = 1$$