

Morgan Joseph - Science

01/11/2021

Introduction to Math and Science (Test 2)

1.

(i) x^{17}

(ii) $16x^{16} \times 3x^2 = 48x^{18}$

(iii) $13 \frac{x^{18}}{x^8} = x^{10}$

(iv)

$6x$

(v) x^8

2.

(i) $7x - 1 = 5x + 4 \quad | + 1 \quad 2x = 5$

$| : 2 \quad x = \frac{5}{2} \quad x = 2.5$

(ii) $30x + 20 = -14x - 7 \quad | + 14x \quad 16x = -27$

$| : 16 \quad x = \frac{-27}{16} \quad x = -1.6875$

(iii) $3(x-1) = 4(2x+1) \quad | : 3 \quad x-1 = \frac{8x+4}{3}$

$| - 1 \quad -5x = 11 \quad | : -5 \quad x = -\frac{11}{5} \quad x = -2.2$

(iv) $x^2 + 4 = x^2 + 5x + 3x + 15$

$x^2 + 4 = x^2 + 8x + 15 \quad | - 15 \quad -11 = 8x$

$x = \frac{-11}{8} \quad | : 1 \quad x = -1.375$

3.

$$(i) (x+7)(x+2) = 0$$

$$x+7=0$$

$$x+2=0$$

$$\Rightarrow x = -7$$

$$\Rightarrow x = -2$$

$$(ii) (x-5)(x-2) = 0$$

$$x-5=0$$

$$x-2=0$$

$$\Rightarrow x = 5$$

$$\Rightarrow x = 2$$

$$(iii) (x+10)(x-2) = 0$$

$$x+10=0$$

$$x-2=0$$

$$x = -10$$

$$x = 2$$

$$(iv) (x+7)(x-7) = 0$$

$$x+7=0$$

$$x-7=0$$

$$x = -7$$

$$x = 7$$

$$(v) (2x-5)(x+4) = 0$$

$$2x-5=0$$

$$x+4=0$$

$$2x = 5 \Rightarrow x = 2.5$$

$$x = -4$$

$$4. \quad 17x^2 = -5x + 14$$

$$17x^2 + 5x - 14 = 0$$

$$= \frac{-5 \pm \sqrt{5^2 - 4(17)(-14)}}{2(17)}$$

$$= \frac{-5 \pm \sqrt{25 + 952}}{34}$$

$$= \frac{-5 \pm \sqrt{977}}{34}$$

$$= \frac{-5 \pm 31.25699922}{34}$$

$$x = \frac{-5 + 31.257}{34}$$

$$\textcircled{a} \quad x = 0.7723$$

$$\textcircled{b} \quad x = \frac{-5 - 31.257}{34}$$

$$x = -1.0664$$

5.

$$\begin{array}{l} \text{x6} \\ \text{---} \\ \text{x2} \end{array} \quad 60x + 3y = 35$$

$$\begin{array}{l} \text{x2} \\ \text{---} \\ \text{x6} \end{array} \quad 70x - 4y = 31$$

$$240x + 20y = 140$$

$$350x - 20y = 155$$

$$590x = 295$$

$$x = \frac{295}{59} \longrightarrow \underline{x = 5}$$

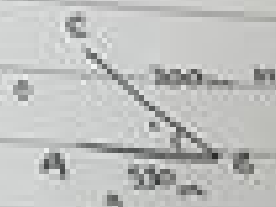
$$6(5) + 3y = 35$$

$$30 + 3y = 35$$

$$3y = 5 \longrightarrow \underline{y = 1}$$

6.

7.



$$\cos B = \frac{530}{550}$$

$$B = 38.2132107^\circ$$

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~~$$\cos B = \frac{530}{550}$$~~

(ii)

$$\text{Angle } 7 = 38.2132107^\circ$$

$$\sin B = \frac{O}{H}$$

(i) $\sin B \times H = O \rightarrow 0.4330127019$