

QUESTION 1

$$\text{Area} = \text{Length} \times \text{Width} \\ = L \times W$$

$$\text{Area of one rectangle} \\ t(t+3) \\ t^2 + 3t$$

$$\text{Area for the whole figure} \\ 7(t^2 + 3t) \\ 7t^2 + 21t$$

$$\underline{\underline{7t^2 + 21t}}$$

QUESTION 2

Let V_b = Speed in Still water

V_w = Speed of water

When water and boat are moving in the same direction.

$$V_b + V_w = \frac{d}{t} = \frac{33}{4} \text{ --- (i)}$$

Moving upstream

$$V_b - V_w = \frac{d}{t_2} = \frac{22}{7} \text{ --- (ii)}$$

$$V_b + V_w = \frac{d}{t_1} = \frac{33}{4} \quad +$$

$$2V_b = \frac{d}{t_1} + \frac{d}{t_2}$$

$$V_b = \frac{(t_1 + t_2)d}{2t_1 t_2}$$

$$V_b = \frac{(4 \text{ hours} + 7 \text{ hours})33}{2 \times 4 \times 7}$$

$$V_b = \frac{11 \times 33}{56}$$

$$\Rightarrow \underline{\underline{6.125}}$$

QUESTION 3

$$n^2 - 2n - 3 = 5$$

$$n^2 - 2n + 2 = 0$$

$$a = 1$$

$$b = -2$$

$$c = 2$$

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

$$= \frac{2 \pm \sqrt{4 + 4 \times 1 \times 2}}{2}$$

$$n = \frac{2 \pm \sqrt{12}}{2}$$

$$n = 2.732 \times 1000$$

$$= 2732$$

QUESTION 4

Rate of train A = x

$$\text{Distance} = x \times 3 = 3x$$

Rate of other train = $20 + x$

$$\text{Distance} = (20 + x) \times 3 = 60 + 3x$$

$$60 + 3x + 3x = 240$$

$$60 + 6x = 240$$

$$6x = 180$$

$$x = 30$$

$$\text{Train A} = 30 + 20 = 50$$

$$\text{Train B} = 30$$

QUESTION 5

$$h = -16t^2 + Vt + S$$

$$h = 0$$

$$V = 55$$

$$S = 60$$

$$0 = -16t^2 + 55t + 60$$

$$a = -16$$

$$b = 55$$

$$c = 60$$

$$\Rightarrow \frac{-55 \pm \sqrt{55^2 + 4 \times 60 \times 16}}{32}$$

$$t = \frac{-55 \pm \sqrt{68.65}}{-32}$$

$$t = \frac{-55 - 82.855}{-32}$$

$$t = 13.7$$

$$t = \frac{-137.855}{-32}$$

$$t = \underline{\underline{\underline{4.307 \text{ seconds}}}}}$$

6

$$\left(\frac{1}{2}n \times 14\right) + \left(\frac{1}{3}n \times 15\right) + \left(\frac{1}{6}n \times 13\right)$$

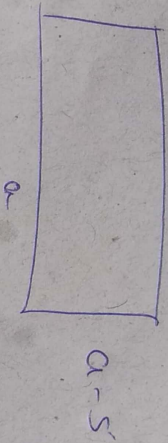
$$\frac{7n + 5n + \frac{13}{6}n}{n} = \frac{14.5n}{n} = \text{mean}$$

$$= 14.567$$

$$\text{median} = 14$$

median would be middle entry when arranged in ascending order hence
 median = 14
 Therefore mean > median.

7



$$a(a-5) = 24$$

$$a^2 - 5a - 24 = 0$$

$$a^2 - 8a + 3a - 24 = 0$$

$$a(a-8) + 3(a-8) = 0$$

$$(a+3)(a-8)$$

$$a = -3 \rightarrow$$

$$a = 8$$

$$\text{length} = 8$$

$$\text{width} = 3$$

8

$$A = P \left(1 + \frac{R}{100} \right)^n$$

$$A = P \left(1 + \frac{R}{n} \right)^{nt}$$

Let the principle be $P \rightarrow \text{Rs.}$

Let P be 1000

t be 1 yr.

Case I

Interest = 0.14% compounded monthly

$$n = 12$$

$$t = 1$$

hence,

$$A = 1000 \left(1 + \frac{0.14}{100 \times 12} \right)^{12 \times 1}$$

$$= 1001.40 \text{ ~~Rs.~~ }$$

case II

Interest = 1.6% compounded annually.

where $n = 1 = t$

hence,

$$A = 1000 \left(1 + \frac{1.6}{100 \times 1} \right)^1$$

$$= 1016.0$$

Therefore, case II is a better plan than case I

QED.

9. $R = \frac{U^2}{g}$

when $U = x$
 $R = 20\text{m}$
 $g = 9.8\text{m/s}^2$

$$20\text{m} = \frac{x^2}{9.8\text{m/s}^2}$$

$$x^2 = 196\text{m}^2/\text{s}^2$$

$$x = \sqrt{196\text{m}^2/\text{s}^2}$$

$$x = 14$$

Initial ~~x~~ velocity = 14m/s

10. $\frac{26}{56}$ → out of 56 ~~seniors~~ ^{students}, only 26 seniors want to have a park clean-up.

$\frac{26}{110}$ → out of 110 seniors, only 26 want to have a park cleanup ~~up~~

$$\text{MAD} = \frac{\sum x_i - \bar{x}}{n} \quad \text{where } \bar{x} = \text{mean}$$

x_i = distance from the mean.

$$\text{mean} = \frac{40 + 55 + 35 + 60 + 20 + 50 + 55}{7} = 45$$

distances

40 - 45 = 5
55 - 45 = 10
35 - 45 = 10
60 - 45 = 15
20 - 45 = 25
50 - 45 = 5

$$5 + 10 + 10 + 15 + 25 + 5 + 10 = 80$$

$$\Rightarrow \frac{80}{45} = 1.78$$

12

$$A = f(t) + g(t)$$

$$a) A = P \left(1 + \frac{r}{n} \right)^{nt} + (570 \text{ £}) 12.$$

where t is number of years.

n = months.

A = Amount.

$$b) A = 14375 \left(1 + \frac{5.3}{100 \times 12} \right)^{12 \times 2} + 570 \times 2 \times 12.$$

$$= 15978.70 + 13680$$

$$= \$ \underline{\underline{29658}}$$