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UNITARY METHOD, RATES & VARIATION MCQs

100 FULLY SOLVED MCQs

PPSC, FPSC & ONE PAPER EXAMS

NTS • CSS MPT • PMS • Government Job Tests

Unitary Method • Unit Rate • Direct Proportion • Inverse Proportion • Variation

Prepared by

MEHREEN KANWAL

MPhil Mathematics

RANA ALI HASAN

MPhil Mathematics

The Math Hub - themathhub.pk | 0301-4058484

The Science Academy - Chak No. 84 NB



UNITARY METHOD, RATES & VARIATION | 100 FULLY SOLVED MCQs

Fast Foundation for One-Paper Exams

Unitary method

$$\text{Value of 1 unit} = \frac{\text{Total value}}{\text{Number of units}}$$

$$\text{Required value} = \text{Value of 1 unit} \times \text{Required units}$$

Unit rate

$$\text{Rate} = \frac{\text{Quantity}}{\text{Number of units}}$$

Examples: km/h, Rs./kg, pages/min.

Direct proportion

$$y \propto x \Rightarrow y = kx$$

$$\frac{y_1}{x_1} = \frac{y_2}{x_2} = k$$

Both quantities move in the same direction.

Inverse proportion

$$y \propto \frac{1}{x} \Rightarrow xy = k$$

$$x_1 y_1 = x_2 y_2$$

One quantity increases while the other decreases.

Combined variation

$$Q \propto ab \Rightarrow \frac{Q_2}{Q_1} = \frac{a_2 b_2}{a_1 b_1}$$

For fixed work:

$$MHD = \text{constant}$$

Exam-speed check Direct: multiply by the same scale factor.

Inverse: multiply one side, divide the other side by that factor.

Always keep units consistent before calculating.

Unitary Method Basics

MCQ 1

If 5 kg of rice cost Rs. 160, what is the cost of 8 kg of rice?

- A. Rs. 256 B. Rs. 224
C. Rs. 288 D. Rs. 320

Solution

$$\text{Cost of 1 kg of rice} = \frac{\text{Rs. 160}}{5} = \text{Rs. 32}$$

$$\text{Cost of 8 kg of rice} = \text{Rs. 32} \times 8 = \text{Rs. 256}$$

Final Answer

Rs. 256

MCQ 2

If 7 kg of sugar cost Rs. 294, what is the cost of 11 kg of sugar?

- A. Rs. 420 B. Rs. 462
C. Rs. 504 D. Rs. 546

Solution

$$\text{Cost of 1 kg of sugar} = \frac{\text{Rs. 294}}{7} = \text{Rs. 42}$$

$$\text{Cost of 11 kg of sugar} = \text{Rs. 42} \times 11 = \text{Rs. 462}$$

Final Answer

Rs. 462

MCQ 3

If 12 notebooks cost Rs. 540, what is the cost of 18 notebooks?

- A. Rs. 765 B. Rs. 855
C. Rs. 810 D. Rs. 900

Solution

$$\text{Cost of 1 notebooks} = \frac{\text{Rs. 540}}{12} = \text{Rs. 45}$$

$$\text{Cost of 18 notebooks} = \text{Rs. 45} \times 18 = \text{Rs. 810}$$

Final Answer

Rs. 810

MCQ 4

If 9 bus tickets cost Rs. 675, what is the cost of 14 bus tickets?

- A. Rs. 975 B. Rs. 1,125
C. Rs. 1,200 D. Rs. 1,050

Solution

$$\text{Cost of 1 bus tickets} = \frac{\text{Rs. 675}}{9} = \text{Rs. 75}$$

$$\text{Cost of 14 bus tickets} = \text{Rs. 75} \times 14 = \text{Rs. 1,050}$$

Final Answer

Rs. 1,050

MCQ 5

If 6 metres of cloth cost Rs. 390, what is the cost of 15 metres of cloth?

- A. Rs. 975 B. Rs. 910
C. Rs. 1,040 D. Rs. 1,105

Solution

$$\text{Cost of 1 metres of cloth} = \frac{\text{Rs. 390}}{6} = \text{Rs. 65}$$

$$\text{Cost of 15 metres of cloth} = \text{Rs. 65} \times 15 = \text{Rs. 975}$$

Final Answer

Rs. 975

MCQ 6

If 8 litres of milk cost Rs. 480, what is the cost of 13 litres of milk?

- A. Rs. 720 B. Rs. 780
C. Rs. 840 D. Rs. 900

Solution

$$\text{Cost of 1 litres of milk} = \frac{\text{Rs. 480}}{8} = \text{Rs. 60}$$

$$\text{Cost of 13 litres of milk} = \text{Rs. 60} \times 13 = \text{Rs. 780}$$

Final Answer

Rs. 780

MCQ 7

If 15 pens cost Rs. 375, what is the cost of 28 pens?

- A. Rs. 675 B. Rs. 725
C. Rs. 700 D. Rs. 750

Solution

$$\text{Cost of 1 pens} = \frac{\text{Rs. 375}}{15} = \text{Rs. 25}$$

$$\text{Cost of 28 pens} = \text{Rs. 25} \times 28 = \text{Rs. 700}$$

Final Answer

Rs. 700

MCQ 8

If 4 exercise books cost Rs. 260, what is the cost of 11 exercise books?

- A. Rs. 650 B. Rs. 780
C. Rs. 845 D. Rs. 715

Solution

$$\text{Cost of 1 exercise books} = \frac{\text{Rs. 260}}{4} = \text{Rs. 65}$$

$$\text{Cost of 11 exercise books} = \text{Rs. 65} \times 11 = \text{Rs. 715}$$

Final Answer

Rs. 715

MCQ 9

If 10 kg of flour cost Rs. 850, what is the cost of 16 kg of flour?

- A. Rs. 1,360 B. Rs. 1,275
C. Rs. 1,445 D. Rs. 1,530

Solution

$$\text{Cost of 1 kg of flour} = \frac{\text{Rs. 850}}{10} = \text{Rs. 85}$$

$$\text{Cost of 16 kg of flour} = \text{Rs. 85} \times 16 = \text{Rs. 1,360}$$

Final Answer

Rs. 1,360

MCQ 10

If 14 packs of paper cost Rs. 630, what is the cost of 20 packs of paper?

- A. Rs. 855 B. Rs. 900
C. Rs. 945 D. Rs. 990

Solution

$$\text{Cost of 1 packs of paper} = \frac{\text{Rs. 630}}{14} = \text{Rs. 45}$$

$$\text{Cost of 20 packs of paper} = \text{Rs. 45} \times 20 = \text{Rs. 900}$$

Final Answer

Rs. 900

MCQ 11

If 3 geometry boxes cost Rs. 225, what is the cost of 14 geometry boxes?

- A. Rs. 975 B. Rs. 1,125
C. Rs. 1,050 D. Rs. 1,200

Solution

$$\text{Cost of 1 geometry boxes} = \frac{\text{Rs. 225}}{3} = \text{Rs. 75}$$

$$\text{Cost of 14 geometry boxes} = \text{Rs. 75} \times 14 = \text{Rs. 1,050}$$

Final Answer

Rs. 1,050

MCQ 12

If 18 bottles of water cost Rs. 720, what is the cost of 25 bottles of water?

- A. Rs. 960 B. Rs. 1,040
C. Rs. 1,080 D. Rs. 1,000

Solution

$$\text{Cost of 1 bottles of water} = \frac{\text{Rs. 720}}{18} = \text{Rs. 40}$$

$$\text{Cost of 25 bottles of water} = \text{Rs. 40} \times 25 = \text{Rs. 1,000}$$

Final Answer

Rs. 1,000

MCQ 13

A machine produces 420 items in 6 hours at a constant rate. How many items will it produce in 9 hours?

- A. 630 items B. 560 items
C. 280 items D. 770 items

Solution

$$\text{Rate} = \frac{420 \text{ items}}{6 \text{ h}} = 70 \text{ items/h}$$

$$\text{In 9 h} = 70 \times 9 = 630 \text{ items}$$

Final Answer

630 items

MCQ 14

A printer produces 360 pages in 12 hours at a constant rate. How many pages will it produce in 25 hours?

- A. 720 pages B. 750 pages
C. 864/5 pages D. 810 pages

Solution

$$\text{Rate} = \frac{360 \text{ pages}}{12 \text{ h}} = 30 \text{ pages/h}$$

$$\text{In } 25 \text{ h} = 30 \times 25 = 750 \text{ pages}$$

Final Answer

750 pages

MCQ 15

A car produces 240 km in 4 hours at a constant rate. How many km will it produce in 7 hours?

- A. 360 km B. 960/7 km
C. 420 km D. 540 km

Solution

$$\text{Rate} = \frac{240 \text{ km}}{4 \text{ h}} = 60 \text{ km/h}$$

$$\text{In } 7 \text{ h} = 60 \times 7 = 420 \text{ km}$$

Final Answer

420 km

MCQ 16

A tap produces 180 litres in 6 hours at a constant rate. How many litres will it produce in 11 hours?

- A. 300 litres B. 1080/11 litres
C. 390 litres D. 330 litres

Solution

$$\text{Rate} = \frac{180 \text{ litres}}{6 \text{ h}} = 30 \text{ litres/h}$$

$$\text{In } 11 \text{ h} = 30 \times 11 = 330 \text{ litres}$$

Final Answer

330 litres

MCQ 17

A factory line produces 960 units in 8 hours at a constant rate. How many units will it produce in 15 hours?

- A. 1,800 units B. 1,680 units
C. 512 units D. 2,040 units

Solution

$$\text{Rate} = \frac{960 \text{ units}}{8 \text{ h}} = 120 \text{ units/h}$$

$$\text{In } 15 \text{ h} = 120 \times 15 = 1,800 \text{ units}$$

Final Answer

1,800 units

MCQ 18

A typist produces 1,500 words in 10 hours at a constant rate. How many words will it produce in 16 hours?

- A. 2,250 words B. 2,400 words
C. 1875/2 words D. 2,700 words

Solution

$$\text{Rate} = \frac{1500 \text{ words}}{10 \text{ h}} = 150 \text{ words/h}$$

$$\text{In } 16 \text{ h} = 150 \times 16 = 2,400 \text{ words}$$

Final Answer

2,400 words

MCQ 19

A pump produces 525 litres in 7 hours at a constant rate. How many litres will it produce in 12 hours?

- A. 825 litres B. 1225/4 litres
C. 900 litres D. 1,050 litres

Solution

$$\text{Rate} = \frac{525 \text{ litres}}{7 \text{ h}} = 75 \text{ litres/h}$$

$$\text{In } 12 \text{ h} = 75 \times 12 = 900 \text{ litres}$$

Final Answer

900 litres

MCQ 20

A baker produces 144 loaves in 6 hours at a constant rate. How many loaves will it produce in 15 hours?

- A. 336 loaves B. 288/5 loaves
C. 408 loaves D. 360 loaves

Solution

$$\text{Rate} = \frac{144 \text{ loaves}}{6 \text{ h}} = 24 \text{ loaves/h}$$

$$\text{In 15 h} = 24 \times 15 = 360 \text{ loaves}$$

Final Answer

360 loaves

Unit Rates & Reverse Unitary Method**MCQ 21**

If 6 kg of tea cost Rs. 270, how many kg of tea can be bought for Rs. 675?

- A. 15 kg of tea B. 14 kg of tea
C. 16 kg of tea D. 17 kg of tea

Solution

$$\text{Cost of 1 kg of tea} = \frac{\text{Rs. } 270}{6} = \text{Rs. } 45$$

$$\text{Required quantity} = \frac{\text{Rs. } 675}{\text{Rs. } 45} = 15$$

Final Answer

15 kg of tea

MCQ 22

If 8 kg of potatoes cost Rs. 360, how many kg of potatoes can be bought for Rs. 585?

- A. 12 kg of potatoes B. 13 kg of potatoes
C. 14 kg of potatoes D. 15 kg of potatoes

Solution

$$\text{Cost of 1 kg of potatoes} = \frac{\text{Rs. } 360}{8} = \text{Rs. } 45$$

$$\text{Required quantity} = \frac{\text{Rs. } 585}{\text{Rs. } 45} = 13$$

Final Answer

13 kg of potatoes

MCQ 23

If 12 books cost Rs. 900, how many books can be bought for Rs. 1,425?

- A. 18 books B. 20 books
C. 19 books D. 21 books

Solution

$$\text{Cost of 1 books} = \frac{\text{Rs. } 900}{12} = \text{Rs. } 75$$

$$\text{Required quantity} = \frac{\text{Rs. } 1425}{\text{Rs. } 75} = 19$$

Final Answer

19 books

MCQ 24

If 5 metres of cable cost Rs. 425, how many metres of cable can be bought for Rs. 1,190?

- A. 13 metres of cable B. 15 metres of cable
C. 16 metres of cable D. 14 metres of cable

Solution

$$\text{Cost of 1 metres of cable} = \frac{\text{Rs. } 425}{5} = \text{Rs. } 85$$

$$\text{Required quantity} = \frac{\text{Rs. } 1190}{\text{Rs. } 85} = 14$$

Final Answer

14 metres of cable

MCQ 25

If 9 tickets cost Rs. 540, how many tickets can be bought for Rs. 1,020?

- A. 17 tickets B. 16 tickets
C. 18 tickets D. 19 tickets

Solution

$$\text{Cost of 1 tickets} = \frac{\text{Rs. } 540}{9} = \text{Rs. } 60$$

$$\text{Required quantity} = \frac{\text{Rs. } 1020}{\text{Rs. } 60} = 17$$

Final Answer

17 tickets

MCQ 26

A bus travels 315 km in 5 hours. What is the unit rate?

- A. 126 km/h B. 63 km/h
C. 64 km/h D. 63/2 km/h

Solution

$$\text{Unit rate} = \frac{315 \text{ km}}{5 \text{ hours}} = 63 \text{ km/h}$$

Final Answer

63 km/h

MCQ 27

A worker earns 5,400 Rs. in 6 days. What is the unit rate?

- A. 1,800 Rs./day B. 901 Rs./day
C. 900 Rs./day D. 450 Rs./day

Solution

$$\text{Unit rate} = \frac{5400 \text{ Rs.}}{6 \text{ days}} = 900 \text{ Rs./day}$$

Final Answer

900 Rs./day

MCQ 28

A printer prints 840 pages in 7 minutes. What is the unit rate?

- A. 240 pages/min B. 121 pages/min
C. 60 pages/min D. 120 pages/min

Solution

$$\text{Unit rate} = \frac{840 \text{ pages}}{7 \text{ minutes}} = 120 \text{ pages/min}$$

Final Answer

120 pages/min

MCQ 29

A pump delivers 1,260 litres in 9 minutes. What is the unit rate?

- A. 140 litres/min B. 280 litres/min
C. 141 litres/min D. 70 litres/min

Solution

$$\text{Unit rate} = \frac{1260 \text{ litres}}{9 \text{ minutes}} = 140 \text{ litres/min}$$

Final Answer

140 litres/min

MCQ 30

A machine makes 1,650 bolts in 11 hours. What is the unit rate?

- A. 300 bolts/h B. 150 bolts/h
C. 151 bolts/h D. 75 bolts/h

Solution

$$\text{Unit rate} = \frac{1650 \text{ bolts}}{11 \text{ hours}} = 150 \text{ bolts/h}$$

Final Answer

150 bolts/h

MCQ 31

A car uses 24 litres of fuel to travel 288 km. What is its mileage?

- A. 24 km/litre B. 13 km/litre
C. 12 km/litre D. 6 km/litre

Solution

$$\text{Mileage} = \frac{288 \text{ km}}{24 \text{ litres}} = 12 \text{ km/litre}$$

Final Answer

12 km/litre

MCQ 32

A shop sells 72 notebooks in 6 packs. What is the unit rate?

- A. 24 notebooks/pack B. 13 notebooks/pack
C. 6 notebooks/pack D. 12 notebooks/pack

Solution

$$\text{Unit rate} = \frac{72 \text{ notebooks}}{6 \text{ packs}} = 12 \text{ notebooks/pack}$$

Final Answer

12 notebooks/pack

MCQ 33

A typist enters 2,400 words in 20 minutes. What is the unit rate?

- A. 120 words/min B. 240 words/min
C. 121 words/min D. 60 words/min

Solution

$$\text{Unit rate} = \frac{2400 \text{ words}}{20 \text{ minutes}} = 120 \text{ words/min}$$

Final Answer

120 words/min

MCQ 34

A tanker carries 8,400 litres in 12 trips. What is the unit rate?

- A. 1,400 litres/trip B. 700 litres/trip
C. 701 litres/trip D. 350 litres/trip

Solution

$$\text{Unit rate} = \frac{8400 \text{ litres}}{12 \text{ trips}} = 700 \text{ litres/trip}$$

Final Answer

700 litres/trip

MCQ 35

A runner covers 18 km in 120 minutes. What is the unit rate?

- A. 3/10 km/min B. 23/20 km/min
C. 3/20 km/min D. 3/40 km/min

Solution

$$\text{Unit rate} = \frac{18 \text{ km}}{120 \text{ minutes}} = \frac{3}{20} \text{ km/min}$$

Final Answer $\frac{3}{20} \text{ km/min}$ **Direct Proportion & Direct Variation****MCQ 36**

If y varies directly as x , and $y = 18$ when $x = 6$, find y when $x = 14$.

- A. 39 B. 45
C. 48 D. 42

Solution

$$y \propto x \Rightarrow \frac{y}{x} = k$$

$$k = \frac{18}{6} = 3$$

$$y = 3 \times 14 = 42$$

Final Answer $y = 42$ **MCQ 37**

If y varies directly as x , and $y = 35$ when $x = 5$, find y when $x = 9$.

- A. 63 B. 56
C. 70 D. 77

Solution

$$y \propto x \Rightarrow \frac{y}{x} = k$$

$$k = \frac{35}{5} = 7$$

$$y = 7 \times 9 = 63$$

Final Answer $y = 63$ **MCQ 38**

If y varies directly as x , and $y = 28$ when $x = 8$, find y when $x = 15$.

- A. 49 B. 105/2
C. 56 D. 119/2

Solution

$$y \propto x \Rightarrow \frac{y}{x} = k$$

$$k = \frac{28}{8} = \frac{7}{2}$$

$$y = \frac{7}{2} \times 15 = \frac{105}{2}$$

Final Answer $y = \frac{105}{2}$ **MCQ 39**

If y varies directly as x , and $y = 42$ when $x = 12$, find y when $x = 20$.

- A. 133/2 B. 147/2
C. 70 D. 77

Solution

$$y \propto x \Rightarrow \frac{y}{x} = k$$

$$k = \frac{42}{12} = \frac{7}{2}$$

$$y = \frac{7}{2} \times 20 = 70$$

Final Answer $y = 70$

MCQ 40

If y varies directly as x , and $y = 63$ when $x = 7$, find y when $x = 11$.

- A. 90 B. 108
C. 117 D. 99

Solution

$$y \propto x \Rightarrow \frac{y}{x} = k$$

$$k = \frac{63}{7} = 9$$

$$y = 9 \times 11 = 99$$

Final Answer

$$y = 99$$

MCQ 41

If y varies directly as x , and $y = 26$ when $x = 4$, find y when $x = 10$.

- A. 65 B. 117/2
C. 143/2 D. 78

Solution

$$y \propto x \Rightarrow \frac{y}{x} = k$$

$$k = \frac{26}{4} = \frac{13}{2}$$

$$y = \frac{13}{2} \times 10 = 65$$

Final Answer

$$y = 65$$

MCQ 42

If y varies directly as x , and $y = 54$ when $x = 9$, find y when $x = 13$.

- A. 72 B. 78
C. 84 D. 90

Solution

$$y \propto x \Rightarrow \frac{y}{x} = k$$

$$k = \frac{54}{9} = 6$$

$$y = 6 \times 13 = 78$$

Final Answer

$$y = 78$$

MCQ 43

If y varies directly as x , and $y = 75$ when $x = 15$, find y when $x = 22$.

- A. 105 B. 115
C. 110 D. 120

Solution

$$y \propto x \Rightarrow \frac{y}{x} = k$$

$$k = \frac{75}{15} = 5$$

$$y = 5 \times 22 = 110$$

Final Answer

$$y = 110$$

MCQ 44

If y varies directly as x , and $y = 21$ when $x = 3$, find y when $x = 8$.

- A. 49 B. 63
C. 70 D. 56

Solution

$$y \propto x \Rightarrow \frac{y}{x} = k$$

$$k = \frac{21}{3} = 7$$

$$y = 7 \times 8 = 56$$

Final Answer

$$y = 56$$

MCQ 45

If y varies directly as x , and $y = 48$ when $x = 16$, find y when $x = 25$.

- A. 75 B. 72
C. 78 D. 81

Solution

$$y \propto x \Rightarrow \frac{y}{x} = k$$

$$k = \frac{48}{16} = 3$$

$$y = 3 \times 25 = 75$$

Final Answer

$$y = 75$$

MCQ 46

At a fixed speed, a car travels 168 km in 3 hours. How far will it travel in 7 hours?

- A. 336 km B. 392 km
C. 448 km D. 504 km

Solution

$$\frac{\text{Required}}{7} = \frac{168}{3}$$

$$\text{Required} = \frac{168 \times 7}{3} = 392$$

Final Answer

392 km

MCQ 47

A recipe uses 450 g of flour for 6 servings. How much flour is required for 14 servings?

- A. 975 g B. 1,125 g
C. 1,050 g D. 1,200 g

Solution

$$\frac{\text{Required}}{14} = \frac{450}{6}$$

$$\text{Required} = \frac{450 \times 14}{6} = 1,050$$

Final Answer

1,050 g

MCQ 48

On a map, 2 cm represents 15 km. What distance does 8 cm represent?

- A. 105/2 km B. 135/2 km
C. 75 km D. 60 km

Solution

$$\frac{\text{Required}}{8} = \frac{15}{2}$$

$$\text{Required} = \frac{15 \times 8}{2} = 60$$

Final Answer

60 km

MCQ 49

Six identical machines make 720 parts in one hour. How many parts will 11 machines make in one hour?

- A. 1,320 parts B. 1,200 parts
C. 1,440 parts D. 1,560 parts

Solution

$$\frac{\text{Required}}{11} = \frac{720}{6}$$

$$\text{Required} = \frac{720 \times 11}{6} = 1,320$$

Final Answer

1,320 parts

MCQ 50

Eight litres of paint cover 96 square metres. How much area will 15 litres cover at the same rate?

- A. 168 m² B. 180 m²
C. 192 m² D. 204 m²

Solution

$$\frac{\text{Required}}{15} = \frac{96}{8}$$

$$\text{Required} = \frac{96 \times 15}{8} = 180$$

Final Answer180 m²**MCQ 51**

For direct proportion between x and y , which quantity remains constant?

- A. xy B. $x + y$
C. y/x D. $x - y$

Solution

$$y = kx \Rightarrow \frac{y}{x} = k$$

Final Answer $\frac{y}{x}$

MCQ 52

If $y = 7x$, what is the constant of proportionality?

- A. $1/7$ B. x
C. y D. 7

Solution

$$y = kx$$

$$k = 7$$

Final Answer

7

MCQ 53

If $y \propto x$ and x is doubled, what happens to y ?

- A. It doubles B. It halves
C. It becomes four times D. It is unchanged

Solution

$$y = kx$$

$$x \rightarrow 2x \Rightarrow y \rightarrow k(2x) = 2y$$

Final Answer

It doubles

MCQ 54

Which relation represents direct variation?

- A. $xy = 5$ B. $y = 5x$
C. $y = 5/x$ D. $x + y = 5$

Solution

Direct variation: $y = kx$

$$y = 5x$$

Final Answer $y = 5x$ **MCQ 55**

If the cost per notebook is fixed, the total cost is directly proportional to which quantity?

- A. Time taken B. Reciprocal of quantity
C. Number of notebooks D. Square of quantity

Solution

Total cost = Unit price $\times$ Number of notebooks

Final Answer

Number of notebooks

Inverse Proportion & Inverse Variation**MCQ 56**

If 12 workers correspond to 15 days for a fixed total, what will correspond to 20 workers?

- A. 8 days B. 10 days
C. 11 days D. 9 days

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$12 \times 15 = 20 \times y_2$$

$$y_2 = \frac{12 \times 15}{20} = 9$$

Final Answer

9 days

MCQ 57

If 8 machines correspond to 18 hours for a fixed total, what will correspond to 12 machines?

- A. 12 hours B. 11 hours
C. 13 hours D. 14 hours

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$8 \times 18 = 12 \times y_2$$

$$y_2 = \frac{8 \times 18}{12} = 12$$

Final Answer

12 hours

MCQ 58

If 60 km/h correspond to 5 hours for a fixed total, what will correspond to 75 km/h?

- A. 3 hours B. 4 hours
C. 5 hours D. 6 hours

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$60 \times 5 = 75 \times y_2$$

$$y_2 = \frac{60 \times 5}{75} = 4$$

Final Answer

4 hours

MCQ 59

If 15 people correspond to 24 days for a fixed total, what will correspond to 20 people?

- A. 17 days B. 19 days
C. 18 days D. 20 days

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$15 \times 24 = 20 \times y_2$$

$$y_2 = \frac{15 \times 24}{20} = 18$$

Final Answer

18 days

MCQ 62

If 10 tractors correspond to 12 days for a fixed total, what will correspond to 15 tractors?

- A. 7 days B. 8 days
C. 9 days D. 10 days

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$10 \times 12 = 15 \times y_2$$

$$y_2 = \frac{10 \times 12}{15} = 8$$

Final Answer

8 days

MCQ 60

If 6 pumps correspond to 10 hours for a fixed total, what will correspond to 15 pumps?

- A. 3 hours B. 5 hours
C. 6 hours D. 4 hours

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$6 \times 10 = 15 \times y_2$$

$$y_2 = \frac{6 \times 10}{15} = 4$$

Final Answer

4 hours

MCQ 63

If 16 labourers correspond to 21 days for a fixed total, what will correspond to 24 labourers?

- A. 13 days B. 15 days
C. 14 days D. 16 days

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$16 \times 21 = 24 \times y_2$$

$$y_2 = \frac{16 \times 21}{24} = 14$$

Final Answer

14 days

MCQ 61

If 4 typists correspond to 9 hours for a fixed total, what will correspond to 6 typists?

- A. 6 hours B. 5 hours
C. 7 hours D. 8 hours

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$4 \times 9 = 6 \times y_2$$

$$y_2 = \frac{4 \times 9}{6} = 6$$

Final Answer

6 hours

MCQ 64

If 12 cows correspond to 30 days for a fixed total, what will correspond to 18 cows?

- A. 19 days B. 21 days
C. 22 days D. 20 days

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$12 \times 30 = 18 \times y_2$$

$$y_2 = \frac{12 \times 30}{18} = 20$$

Final Answer

20 days

MCQ 65

If 9 taps correspond to 8 hours for a fixed total, what will correspond to 12 taps?

- A. 6 hours B. 5 hours
C. 7 hours D. 8 hours

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$9 \times 8 = 12 \times y_2$$

$$y_2 = \frac{9 \times 8}{12} = 6$$

Final Answer

6 hours

MCQ 66

If 24 students correspond to 15 candies each for a fixed total, what will correspond to 30 students?

- A. 11 candies each B. 12 candies each
C. 13 candies each D. 14 candies each

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$24 \times 15 = 30 \times y_2$$

$$y_2 = \frac{24 \times 15}{30} = 12$$

Final Answer

12 candies each

MCQ 67

If 20 gear teeth correspond to 60 rpm for a fixed total, what will correspond to 30 gear teeth?

- A. 39 rpm B. 41 rpm
C. 40 rpm D. 42 rpm

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$20 \times 60 = 30 \times y_2$$

$$y_2 = \frac{20 \times 60}{30} = 40$$

Final Answer

40 rpm

MCQ 68

If 12 metres length correspond to 20 metres width for a fixed total, what will correspond to 15 metres length?

- A. 15 metres width B. 17 metres width
C. 18 metres width D. 16 metres width

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$12 \times 20 = 15 \times y_2$$

$$y_2 = \frac{12 \times 20}{15} = 16$$

Final Answer

16 metres width

MCQ 69

If 80 km/h correspond to 3 hours for a fixed total, what will correspond to 60 km/h?

- A. 4 hours B. 3 hours
C. 5 hours D. 6 hours

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$80 \times 3 = 60 \times y_2$$

$$y_2 = \frac{80 \times 3}{60} = 4$$

Final Answer

4 hours

MCQ 70

If 5 printers correspond to 4 hours for a fixed total, what will correspond to 8 printers?

- A. 3/2 hours B. 5/2 hours
C. 7/2 hours D. 9/2 hours

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$5 \times 4 = 8 \times y_2$$

$$y_2 = \frac{5 \times 4}{8} = \frac{5}{2}$$

Final Answer $\frac{5}{2}$ hours

MCQ 71

If 14 workers correspond to 30 days for a fixed total, what will correspond to 21 workers?

- A. 19 days B. 21 days
C. 20 days D. 22 days

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$14 \times 30 = 21 \times y_2$$

$$y_2 = \frac{14 \times 30}{21} = 20$$

Final Answer

20 days

MCQ 74

If 3 pumps correspond to 14 hours for a fixed total, what will correspond to 7 pumps?

- A. 5 hours B. 6 hours
C. 7 hours D. 8 hours

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$3 \times 14 = 7 \times y_2$$

$$y_2 = \frac{3 \times 14}{7} = 6$$

Final Answer

6 hours

MCQ 72

If 30 people correspond to 18 days for a fixed total, what will correspond to 45 people?

- A. 11 days B. 13 days
C. 14 days D. 12 days

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$30 \times 18 = 45 \times y_2$$

$$y_2 = \frac{30 \times 18}{45} = 12$$

Final Answer

12 days

MCQ 75

If 18 machines correspond to 10 hours for a fixed total, what will correspond to 30 machines?

- A. 5 hours B. 7 hours
C. 6 hours D. 8 hours

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$18 \times 10 = 30 \times y_2$$

$$y_2 = \frac{18 \times 10}{30} = 6$$

Final Answer

6 hours

MCQ 73

If 25 men correspond to 16 days for a fixed total, what will correspond to 40 men?

- A. 10 days B. 9 days
C. 11 days D. 12 days

Solution

$$x \propto \frac{1}{y} \Rightarrow x_1 y_1 = x_2 y_2$$

$$25 \times 16 = 40 \times y_2$$

$$y_2 = \frac{25 \times 16}{40} = 10$$

Final Answer

10 days

Compound & Combined Variation**MCQ 76**

A factory output is proportional to machines $\times$ hours. Four machines working 5 hours produce 600 units. How many units will 6 machines working 8 hours produce?

- A. 1,410 units B. 1,470 units
C. 1,500 units D. 1,440 units

Solution

$$Q \propto ab$$

$$\frac{Q_2}{Q_1} = \frac{a_2 b_2}{a_1 b_1}$$

$$Q_2 = 600 \times \frac{6 \times 8}{4 \times 5} = 1,440$$

Final Answer

1,440 units

MCQ 77

Production is proportional to workers $\times$ days. Fifteen workers in 12 days produce 900 units. How many units will 20 workers in 9 days produce?

- A. 900 units B. 895 units
C. 905 units D. 910 units

Solution

$$Q \propto ab$$

$$\frac{Q_2}{Q_1} = \frac{a_2 b_2}{a_1 b_1}$$

$$Q_2 = 900 \times \frac{20 \times 9}{15 \times 12} = 900$$

Final Answer

900 units

MCQ 78

Total wages are proportional to workers $\times$ days. Eight workers for 5 days earn Rs. 12,000. What will 12 workers for 7 days earn?

- A. Rs. 24,900 B. Rs. 25,200
C. Rs. 25,500 D. Rs. 25,800

Solution

$$Q \propto ab$$

$$\frac{Q_2}{Q_1} = \frac{a_2 b_2}{a_1 b_1}$$

$$Q_2 = 12000 \times \frac{12 \times 7}{8 \times 5} = 25,200$$

Final Answer

Rs. 25,200

MCQ 79

Food consumed is proportional to people $\times$ days. Twenty people in 15 days consume 300 kg. How much will 30 people consume in 10 days?

- A. 299 kg B. 301 kg
C. 300 kg D. 302 kg

Solution

$$Q \propto ab$$

$$\frac{Q_2}{Q_1} = \frac{a_2 b_2}{a_1 b_1}$$

$$Q_2 = 300 \times \frac{30 \times 10}{20 \times 15} = 300$$

Final Answer

300 kg

MCQ 80

Pages printed are proportional to printers $\times$ hours. Three printers working 4 hours print 1,200 pages. How many pages will 5 printers working 6 hours print?

- A. 2,900 pages B. 3,100 pages
C. 3,200 pages D. 3,000 pages

Solution

$$Q \propto ab$$

$$\frac{Q_2}{Q_1} = \frac{a_2 b_2}{a_1 b_1}$$

$$Q_2 = 1200 \times \frac{5 \times 6}{3 \times 4} = 3,000$$

Final Answer

3,000 pages

MCQ 81

Water pumped is proportional to pumps $\times$ hours. Four pumps working 3 hours move 2,400 litres. How much will 6 pumps working 5 hours move?

- A. 6,000 litres B. 5,800 litres
C. 6,200 litres D. 6,400 litres

Solution

$$Q \propto ab$$

$$\frac{Q_2}{Q_1} = \frac{a_2 b_2}{a_1 b_1}$$

$$Q_2 = 2400 \times \frac{6 \times 5}{4 \times 3} = 6,000$$

Final Answer

6,000 litres

MCQ 82

Harvest collected is proportional to workers $\times$ hours. Ten workers in 6 hours collect 1,800 kg. How much will 15 workers in 8 hours collect?

- A. 3,570 kg B. 3,600 kg
C. 3,630 kg D. 3,660 kg

Solution

$$Q \propto ab$$

$$\frac{Q_2}{Q_1} = \frac{a_2 b_2}{a_1 b_1}$$

$$Q_2 = 1800 \times \frac{15 \times 8}{10 \times 6} = 3,600$$

Final Answer

3,600 kg

MCQ 83

10 workers working 6 hours per day finish a job in 8 days. In how many days will 12 workers working 5 hours per day finish the same job?

- A. 6 days B. 10 days
C. 8 days D. 12 days

Solution

Fixed work $\Rightarrow MHD = \text{constant}$

$$10 \times 6 \times 8 = 12 \times 5 \times d$$

$$d = \frac{10 \times 6 \times 8}{12 \times 5} = 8$$

Final Answer

8 days

MCQ 84

16 workers working 7 hours per day finish a job in 15 days. In how many days will 20 workers working 6 hours per day finish the same job?

- A. 12 days B. 16 days
C. 18 days D. 14 days

Solution

Fixed work $\Rightarrow MHD = \text{constant}$

$$16 \times 7 \times 15 = 20 \times 6 \times d$$

$$d = \frac{16 \times 7 \times 15}{20 \times 6} = 14$$

Final Answer

14 days

MCQ 85

12 workers working 8 hours per day finish a job in 10 days. In how many days will 15 workers working 8 hours per day finish the same job?

- A. 8 days B. 6 days
C. 10 days D. 12 days

Solution

Fixed work $\Rightarrow MHD = \text{constant}$

$$12 \times 8 \times 10 = 15 \times 8 \times d$$

$$d = \frac{12 \times 8 \times 10}{15 \times 8} = 8$$

Final Answer

8 days

MCQ 86

18 workers working 5 hours per day finish a job in 12 days. In how many days will 20 workers working 6 hours per day finish the same job?

- A. 7 days B. 9 days
C. 11 days D. 13 days

Solution

Fixed work $\Rightarrow MHD = \text{constant}$

$$18 \times 5 \times 12 = 20 \times 6 \times d$$

$$d = \frac{18 \times 5 \times 12}{20 \times 6} = 9$$

Final Answer

9 days

MCQ 87

If $y \propto xz$, and $y = 24$ when $x = 3, z = 4$, find y when $x = 5, z = 6$.

- A. 48 B. 72
C. 60 D. 90

Solution

$$y = kxz$$

$$24 = k(3)(4) \Rightarrow k = 2$$

$$y = 2(5)(6) = 60$$

Final Answer

60

MCQ 88

If $y \propto x/z$, and $y = 18$ when $x = 6, z = 2$, find y when $x = 10, z = 5$.

- A. 6 B. 15
C. 30 D. 12

Solution

$$y = k \frac{x}{z}$$

$$18 = k \frac{6}{2} = 3k \Rightarrow k = 6$$

$$y = 6 \frac{10}{5} = 12$$

Final Answer

12

MCQ 89

If $y \propto x^2$ and $y = 20$ when $x = 2$, find y when $x = 5$.

- A. 125 B. 50
C. 100 D. 250

Solution

$$y = kx^2$$

$$20 = k(2^2) = 4k \Rightarrow k = 5$$

$$y = 5(5^2) = 125$$

Final Answer

125

MCQ 90

If $y \propto 1/x^2$ and $y = 48$ when $x = 2$, find y when $x = 4$.

- A. 6 B. 12
C. 24 D. 96

Solution

$$y = \frac{k}{x^2}$$

$$48 = \frac{k}{4} \Rightarrow k = 192$$

$$y = \frac{192}{16} = 12$$

Final Answer

12

Mixed High-Yield One-Paper Patterns**MCQ 91**

Five kilograms of vegetables cost Rs. 80. At the same rate, what will 8 kilograms cost?

- A. Rs. 120 B. Rs. 126
C. Rs. 128 D. Rs. 130

Solution

$$1 \text{ kg cost} = \frac{80}{5} = 16$$

$$8 \text{ kg cost} = 16 \times 8 = 128$$

Final Answer

Rs. 128

MCQ 92

Forty workers can complete a fixed job in 25 days. How many days will 20 workers take at the same efficiency?

- A. 40 days B. 45 days
C. 60 days D. 50 days

Solution

$$40 \times 25 = 20 \times d$$

$$d = \frac{40 \times 25}{20} = 50$$

Final Answer

50 days

MCQ 93

Seven notebooks cost Rs. 490. What is the cost of 13 notebooks?

- A. Rs. 910 B. Rs. 840
C. Rs. 880 D. Rs. 980

Solution

$$1 \text{ notebook} = \frac{490}{7} = 70$$

$$13 \text{ notebooks} = 70 \times 13 = 910$$

Final Answer

Rs. 910

MCQ 94

A vehicle covers 560 km in 8 hours at constant speed. How far will it cover in 2.5 hours?

- A. 140 km B. 175 km
C. 168 km D. 200 km

Solution

$$\text{Speed} = \frac{560}{8} = 70 \text{ km/h}$$

$$D = 70 \times 2.5 = 175 \text{ km}$$

Final Answer

175 km

MCQ 95

Food for 24 people lasts 20 days. If 6 people leave, for how many days will the same food last?

- A. 24 days B. 25 days
C. 26 $\frac{2}{3}$ days D. 30 days

Solution

$$24 \times 20 = 18 \times d$$

$$d = \frac{480}{18} = \frac{80}{3} = 26\frac{2}{3}$$

Final Answer

$$26\frac{2}{3} \text{ days}$$

MCQ 96

Six kilograms of tea cost Rs. 4,500. How many kilograms can be bought for Rs. 6,375 at the same rate?

- A. 8 kg B. 9 kg
C. 10 kg D. 17/2 kg

Solution

$$1 \text{ kg cost} = \frac{4500}{6} = 750$$

$$\text{Quantity} = \frac{6375}{750} = 8.5 \text{ kg}$$

Final Answer

$$8.5 \text{ kg}$$

MCQ 97

For a fixed distance, speed and travel time are:

- A. Inversely proportional B. Directly proportional
C. Equal D. Unrelated

Solution

$$T = \frac{D}{S}$$

$$D \text{ fixed} \Rightarrow T \propto \frac{1}{S}$$

Final Answer

Inversely proportional

MCQ 98

Which expression gives the unit rate when a quantity Q is obtained in n equal units?

- A. Qn B. Q/n
C. n/Q D. $Q + n$

Solution

$$\text{Unit rate} = \frac{\text{Total quantity}}{\text{Number of units}} = \frac{Q}{n}$$

Final Answer

$$\frac{Q}{n}$$

MCQ 99

For inverse proportion between x and y , which quantity remains constant?

- A. y/x B. $x + y$
C. xy D. $x - y$

Solution

$$y = \frac{k}{x} \Rightarrow xy = k$$

Final Answer

$$xy$$

MCQ 100

If $x \propto y$ and $y \propto z$, then which relation is correct?

- A. $x \propto 1/z$ B. $xz = 1$
C. $x = z^2$ D. $x \propto z$

Solution

$$x = ay, \quad y = bz$$

$$x = a(bz) = abz$$

$$\therefore x \propto z$$

Final Answer

$$x \propto z$$

RAPID REVISION GRID | UNITARY METHOD & VARIATION

One-unit route

$$1 \text{ unit} = \frac{\text{Known total}}{\text{Known units}}$$

Then multiply by required units.

Direct proportion

$$\frac{y_1}{x_1} = \frac{y_2}{x_2}$$

Inverse proportion

$$x_1 y_1 = x_2 y_2$$

Unit rate

$$\text{Rate} = \frac{\text{Quantity}}{\text{Unit count}}$$

Direct scaling shortcut If the input is multiplied by r , the output is also multiplied by r .

Inverse scaling shortcut If one quantity is multiplied by r , the other is divided by r .

Combined output

$$Q \propto ab$$

Scale by both factor changes.

Fixed work

$$MHD = \text{constant}$$

Use the product of workers, hours per day and days.

Fast decision rule Same direction $\Rightarrow$ direct.
Opposite direction with fixed total $\Rightarrow$ inverse.

Final check The answer must carry the requested unit: rupees, kg, km, hours, days, items, litres, pages, etc.

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