

INTEGRATED

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Class: VIII. MATHEMATICS

4. DIRECT AND INVERSE PROPORTIONS

01. Inverse Proportion

$$40 \times 15 = 25 \times x$$

$$\Rightarrow x = 24 \text{ days}$$

Ans: C

02. Direct Proportion

$$10 : 800 = 16 : x$$

$$\Rightarrow x = \frac{800 \times 16}{10} = 1280$$

Ans: B

03

$$1 : 25 = 32 : x \quad (\text{Direct proportion})$$

$$\Rightarrow x = 25 \times 32 = 800$$

Ans: C

04

9 workers make 405 toys in 15 days.

$$\therefore \text{The work rate} = \frac{405}{9 \times 15} = \frac{405}{135} = 3 \text{ toys}$$

per worker per day

$$\text{Required answer} = \frac{540}{15 \times R} = \frac{540}{15 \times 3} = 12 \text{ workers}$$

Ans: C

05 $25 : 350 = x : 140$

$$\Rightarrow x = \frac{25 \times 140}{350} = 10L$$

Ans: A

06. Inverse proportion

$$6 \times 8 = 8 \times x$$

$$\Rightarrow x = 6 \text{ days}$$

Ans: A



07. $36 \times 25 = 15 \times x$
 $\Rightarrow x = \frac{36 \times 25}{15} = 60$

Ans: C

08. $4 : 441 = 22 : x$
 $\Rightarrow x = \frac{441 \times 22}{14} = 693$

Ans: D

09. $0.6 \times x = 0.09 \times y$
 $\Rightarrow x = \frac{0.09}{0.6} = \frac{9}{60} = \frac{3}{20} = 3 : 20$

Ans: D

10. $x \propto \frac{1}{y} \Rightarrow xy = k$
 $\Rightarrow 4 \times 6 = k$
 $\Rightarrow k = 24$

$xy = 24$
 $3xy = 24$
 $y = 8$

Ans: A

JEE ADVANCED

11. A) $20 : 280 = 10 : x$
 $\Rightarrow x = \frac{280 \times 10}{20} = 140 \text{ km (Tare)}$

B) $20 : 280 = 35 : x$
 $\Rightarrow x = \frac{280 \times 35}{20} = 490 \text{ km (Tare)}$

C) $\text{Mileage} = \frac{280}{20} = 14 \text{ km (lit (Tare))}$

D) $20 : 280 = 5 : x$
 $\Rightarrow x = \frac{280 \times 5}{20} = 70 \text{ km (Tare)}$

Ans: A, B, C, D

12 Conceptual: A, B, D

Ans: A, B, D

13.

13. Statement I: $6 \times 9 = 9 \times x$ (3)

$$\Rightarrow x = 6 \text{ hours}$$

Statement II: Conceptual (True)

Ans. A

14. Statement I: $24 \times 7 = 12 \times x$ (which is false)

Statement II: Conceptual (True)

Ans. D

15. Assertion: $5 : 150 = 10 : 300$

$$\Rightarrow \frac{5}{150} = \frac{10}{300}$$

$$\Rightarrow \frac{1}{30} = \frac{1}{30} \text{ (True)}$$

Reason: Conceptual (True)

Ans. A

16. Assertion: Conceptual (~~True~~) (False)

Reason: Conceptual (True)

Ans. D

17. Original students = 400

New students joined = 100.

\therefore Total students = 500

$$\therefore 400 \times 20 = 500 \times x$$

$$\Rightarrow x = \frac{20 \times 400}{500} = 16 \text{ days}$$

Ans. B

18. Original students = 400.

100 students left

\therefore Total students = $400 - 100 = 300$

$$\therefore 400 \times 20 = 300 \times x$$

$$\Rightarrow x = \frac{400 \times 20}{300} = 26.6 \text{ (26 days) Ans. D}$$

19. Speed = 105 km/hr

Time = 20 minutes =

$$105 : 60 \text{ minutes} = x : 20 \text{ minutes}$$

$$\Rightarrow x = \frac{105 \times 20}{60} = 35 \text{ km}$$

Ans: C

20

$$105 : 60 = 210 : x$$

$$\Rightarrow x = \frac{60 \times 210}{105} = 120 \text{ minutes}$$

Ans: A

21.

$$360 \times 30 = 420 \times x$$

$$\Rightarrow x = \frac{360 \times 30}{420} = 25$$

Ans: 25

22

$$\frac{1}{6} : \frac{x}{x} = \frac{1}{x} : \frac{1}{216} \quad | \quad x = 36$$

$$\Rightarrow \frac{1}{x^2} = \frac{1}{6 \times 216}$$

Ans: 36

23

a) $360 \times 30 = 420 \times x$

$$\Rightarrow x = \frac{360 \times 30}{420} = 25 \text{ (P)}$$

b) $10 : 450 = 15 : x$

$$\Rightarrow x = \frac{450 \times 15}{10} = 675 \text{ (Q)}$$

c) $18 \times 24 = 27 \times x$

$$\Rightarrow x = \frac{18 \times 24}{27} = 16 \text{ (R)}$$

d) $20 \times 30 = 10 \times x$

$$\Rightarrow x = \frac{20 \times 30}{10} = 60 \text{ days (S)}$$

Ans: P, Q, R, S



$$24. a) 93 : 1395 = 105 : x$$

(5)

$$\Rightarrow x = \frac{1395 \times 105}{93} = 1575 (g)$$

$$b) 55 \times 16 = x \times 10$$

$$\Rightarrow x = \frac{55 \times 16}{10} = 88 (r)$$

$$c) 18 \times 35 = 15 \times x$$

$$\Rightarrow x = \frac{18 \times 35}{15} = 42 (p)$$

$$d) \text{Typing speed} = \frac{1080}{60} = 18 (q) \quad \text{Ans: r, s, p, q}$$

LEARNER'S TASK (CUE'S)

01. Conceptual

Ans: B

02. Conceptual

Ans: B

$$03 \quad 1.5 \text{ mt} = 1.5 \times 100 \text{ cm} = 150 \text{ cm}$$

$$\therefore \frac{45}{150} = 3:10$$

Ans: C

$$04 \quad x = \frac{3 \times 15}{9} = 5$$

Ans: B

05. Let the numbers be $5x, 8x$

$$5x + 8x = 65 \Rightarrow x = 5$$

$$\therefore \text{Larger number} = 8x = 8 \times 5 = 40$$

Ans: C

06. Conceptual

Ans: A

07. Conceptual

Ans: A

08. Conceptual

Ans: D



09 Conceptual

Ans: B⁽⁶⁾

10 $2b = 3a$

Ans: B

JEE MAINS LEVEL

01. $x = \frac{24 \times 7}{8} = 21$

Ans: C

02 $5 \times 28 = 14 \times x$

$\Rightarrow x = \frac{5 \times 28}{14} = 10 \text{ days}$

Ans: B

03 Ratio = 3:4:7

The longest piece = $\frac{7}{14} \times 84 = 42 \text{ mt}$ Ans: D

04 $24 \times 18 = 16 \times x$

$\Rightarrow x = \frac{24 \times 18}{16} = 27 \text{ days}$

Ans: C

05 $\frac{a}{b-a} = \frac{7}{8} \quad \Rightarrow 15a = 7b$

$\Rightarrow 8a = 7b - 7a \quad \Rightarrow a:b = 7:15$

Ans: A

07 2, 7, 5, $(\frac{x}{2})$ are in proportion

$\therefore 2 \times \frac{x}{2} = 7 \times 5 \Rightarrow x = 35$

Ans: C

08 $5:750 = 8:x$

$\Rightarrow x = \frac{750 \times 8}{5} = \text{Rs } 1200$

Ans: C

08 $450:30 = x:9$

$\Rightarrow x = \frac{450 \times 9}{30} = 135$

Ans: B

98. $x \propto \frac{1}{y} \Rightarrow xy = k$ | $xy = 60$ (7)
 $\Rightarrow 10 \times 6 = k$ | $15 \times y = 60$
 $\Rightarrow k = 60$ | $y = 4$ Ans: C

99. $6 \times 7 = 21 \times x \Rightarrow x = 2$ Ans: A

JEE ADVANCED

11. Conceptual Ans: B, D

12. $x \propto y \Rightarrow x = ky$ (6) $\frac{x_1}{y_1} = \frac{x_2}{y_2}$ Ans: A, B

13. Statement I: Conceptual (True)
Statement II: Conceptual (False) Ans: K

14. Statement I: $50 \times 1 = 2 \times 25$ (True)
Statement II: Conceptual (False) Ans: C

15. Assertion: $A : B = 2 : 3$, total = Rs 1200
 A 's share = $\frac{2}{5} \times 1200 = \text{Rs } 480$ (True)
Reason: Mathematically (True) Ans: A

16. Assertion: Conceptual (True)
Reason: Conceptual (True) Ans: A

~~17~~ $6 \times 9 = 9 \times x \Rightarrow x = 6$ hours Ans: A

18. Conceptual Ans: D

19. $60 \times 6 = 45 \times x$
 $\Rightarrow x = 8$ hours Ans: C

20. A can do a piece of work in 24 days (8)

$$\therefore \text{In 1 day the work done by A} = \frac{1}{24}$$

Similarly " " " " B = $\frac{1}{30}$

$$\begin{aligned} \text{" " " " A+B} &= \frac{1}{24} + \frac{1}{30} \\ &= \frac{9}{120} \end{aligned}$$

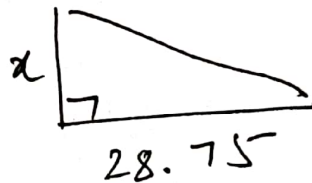
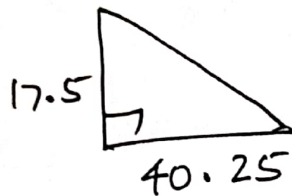
A and B finish the work in $\frac{120}{9}$ days

$$= 13\frac{1}{3} \text{ days} \quad \text{Ans: B}$$

21. Smallest number = $\frac{5}{12} \times 72 = 30$

Ans: 30

22.



$$\frac{x}{17.5} = \frac{28.75}{40.25}$$

$$x = \frac{28.75}{40.25} \times 17.5 = 12.5$$

$$\therefore \text{Given } 11.5 + n = 12.5$$
$$n = 1$$

Ans: 1

23 a) $240 : 4 = x : 7$

$$x = \frac{240 \times 7}{4} = 420 \text{ (p)}$$

b) $150 : 3 = x : 5$

$$\Rightarrow x = \frac{150 \times 5}{3} = 250 \text{ (q)}$$

$$c) 180:3 = x:6$$

$$\Rightarrow x = \frac{180 \times 6}{3} = 360 (q)$$

$$d) 120:2 = x:5$$

$$\Rightarrow x = \frac{120 \times 5}{2} = 300 (s)$$

Am. p, q, r, s

$$24 a) 32 \times 45 = 72 \times x$$

$$\Rightarrow x = \frac{32 \times 45}{72} = 20 (p)$$

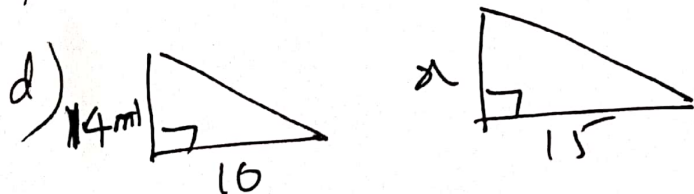
$$b) 5 \times 60 \text{ min} = 12 \times x$$

$$\Rightarrow x = \frac{5 \times 60}{12} = 25 \text{ min} (q)$$

c) $W = P \times T = 550 \times 100 = 55,000$ person-days
 Work done in the first 10 days by 550 people.

$\therefore W_{\text{Completed}} = 550 \times 10 = 5,500$ person-days

The remainder work = $W - W_{\text{Completed}}$
 $= 55,000 - 5,500 = 49,500$.
 The no. of additional days needed = $\frac{49,500}{600} = 82 \frac{1}{2}$ days
 (s)



$$\frac{14}{10} = \frac{x}{15}$$

$$\Rightarrow x = 21 \text{ mt} (r)$$

Am. p, q, s, r

\Rightarrow THE END \Leftarrow