

AFCAT 1 2025

MATHS

**SPEED DISTANCE AND TIME
CLOCK**

LIVE

NAVJYOTI SIR

SSBCrack
EXAMS



31 Oct 2024 Live Classes Schedule

8:00AM	OCTOBER 2024 MONTHLY CURRENT AFFAIRS	RUBY MA'AM
9:00AM	OCTOBER 2024 MONTHLY DEFENCE UPDATES	DIVYANSHU SIR

NDA 1 2025 LIVE CLASSES

11:30AM	GK - ANCIENT HISTORY - CLASS 2	RUBY MA'AM
1:00PM	CHEMISTRY MCQ - CLASS 1	SHIVANGI MA'AM
4:00PM	MATHS - VECTOR ALGEBRA - CLASS 1	NAVJYOTI SIR
5:30PM	ENGLISH - CLOZE TEST - CLASS 2	ANURADHA MA'AM

CDS 1 2025 LIVE CLASSES

11:30AM	GK - ANCIENT HISTORY - CLASS 2	RUBY MA'AM
1:00PM	CHEMISTRY MCQ - CLASS 1	SHIVANGI MA'AM
5:30PM	ENGLISH - CLOZE TEST - CLASS 2	ANURADHA MA'AM

AFCAT 1 2025 LIVE CLASSES

4:00PM	STATIC GK - INDIA & UNO	DIVYANSHU SIR
5:30PM	ENGLISH - CLOZE TEST - CLASS 2	ANURADHA MA'AM
7:00PM	MATHS - SDT & CLOCKS	NAVJYOTI SIR



SPEED, DISTANCE AND TIME (SDT)

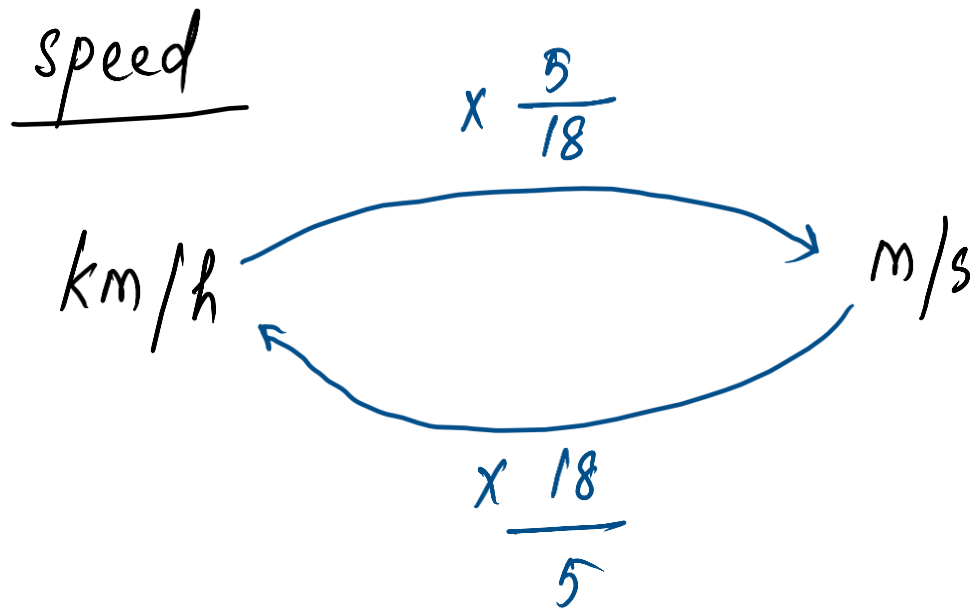
SPEED

$$\text{Speed} = \frac{\text{Distance Travelled (d)}}{\text{Time Taken (t)}} \rightarrow \begin{array}{l} \text{Units} \rightarrow \text{km, m} \\ \text{Time} \rightarrow \begin{array}{l} \downarrow \\ \text{h, s} \end{array} \end{array}$$

$$d = s \times t$$

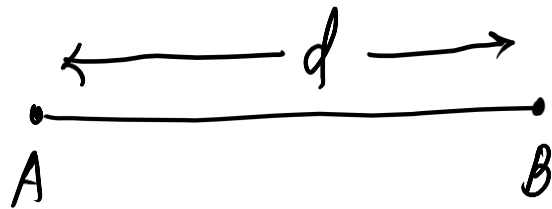
$$t = \frac{d}{s}$$

UNITS



AVERAGE SPEED

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$



$$A \rightarrow B \text{ (} s_1 \text{ km/h)}$$

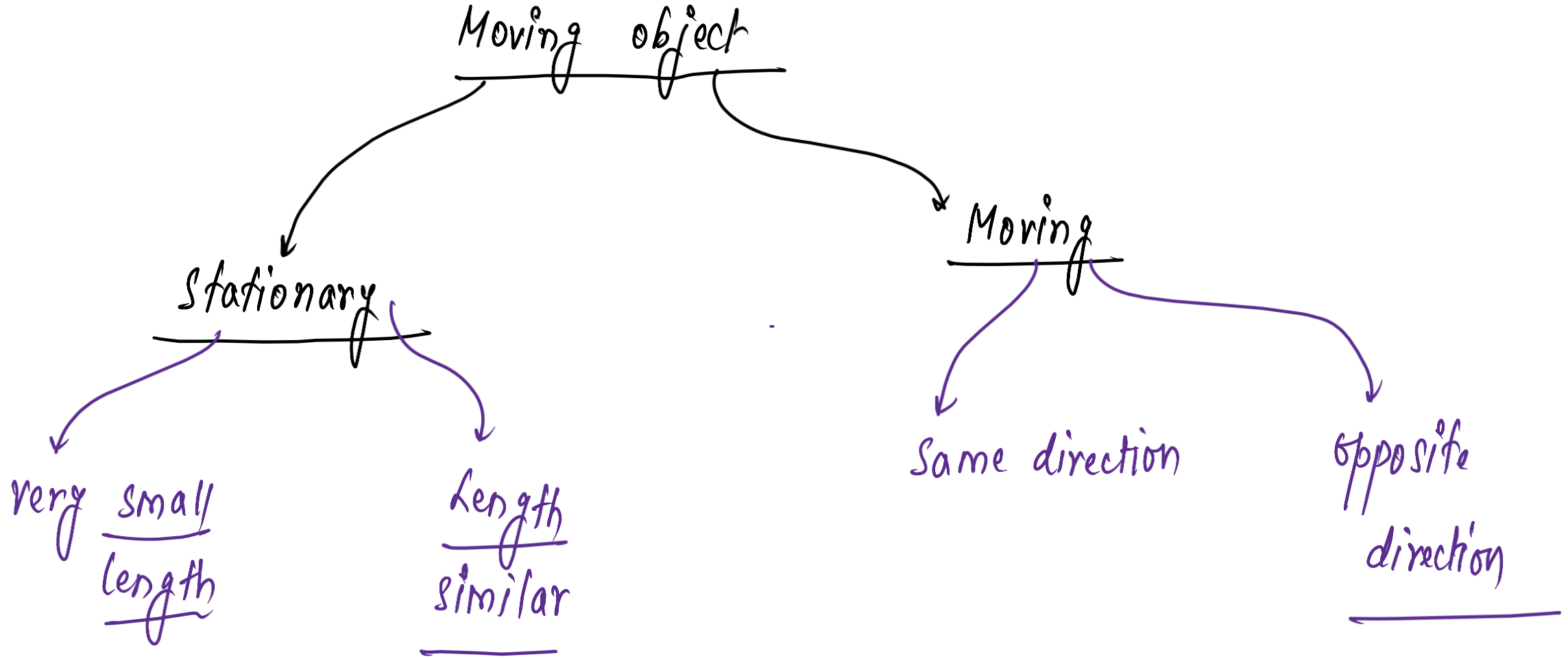
$$B \rightarrow A \text{ (} s_2 \text{ km/h)}$$

$$\text{Average speed from A to B and then B to A} = \frac{d + d}{\frac{d}{s_1} + \frac{d}{s_2}}$$

$$\text{average speed} = \frac{2d}{\frac{d}{s_1} + \frac{d}{s_2}} = \frac{2}{\frac{1}{s_1} + \frac{1}{s_2}}$$

$$\text{avg. speed} = \frac{2s_1s_2}{s_1 + s_2}$$

TIME TO CROSS



Stationary

Moving object be of length L and speed v .

→ if object to cross is of small length, (eg - pole,
man,

$$\text{Time to cross} = \frac{L}{v}$$

tree,
telegraph)

→ comparable length (platform, bridge, tunnel etc.)

L_2 — length

L_1 — length of moving object

$$\text{Time to cross} = \frac{L_1 + L_2}{v}$$

v — speed of moving object

MOVING OBJECT

→ same direction → $\frac{L}{v_1 - v_2}$

→ opposite direction → $\frac{L}{v_1 + v_2}$

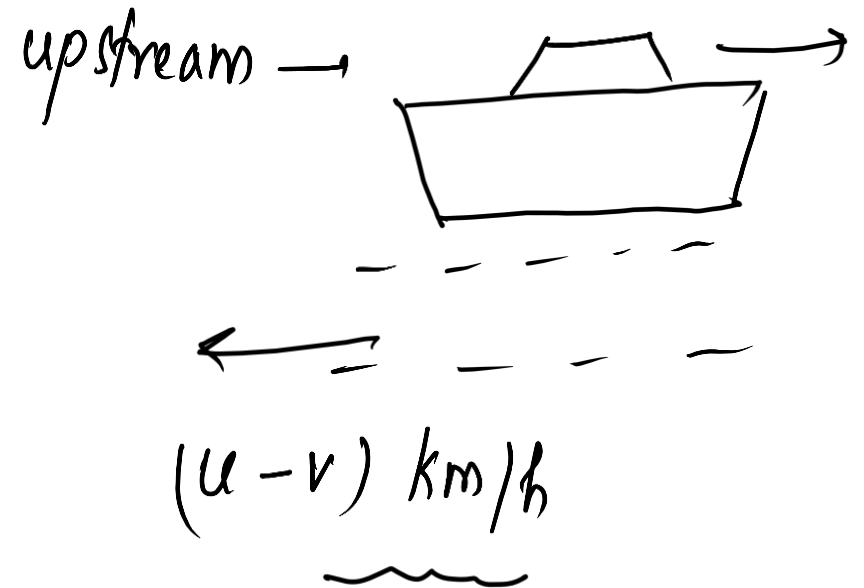
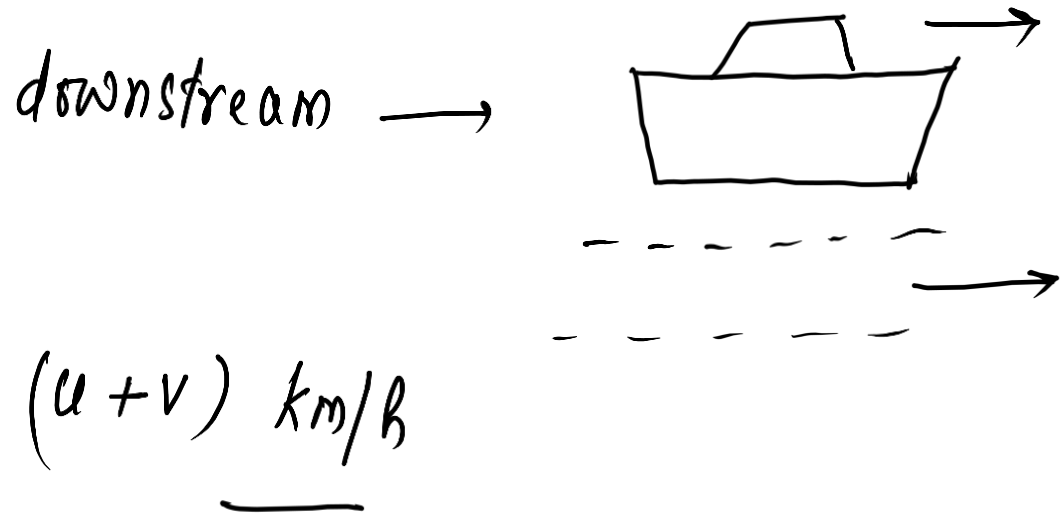
Relative speed
same direction → $v_1 - v_2$
opposite direction → $v_1 + v_2$

Q.) Two trains of length L_1 and L_2 ,
moving with speed u and v in same direction. Find
the time taken by faster train to cross slower one.

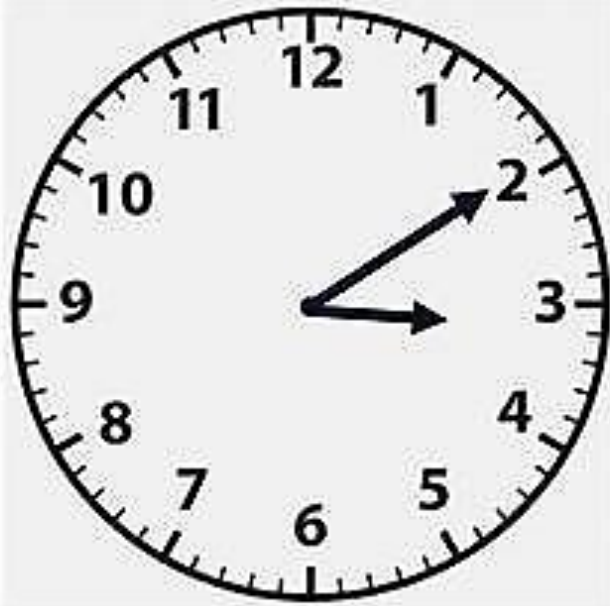
Ans. Time to cross =
$$\frac{L_1 + L_2}{u - v}$$

BOAT AND STREAM

speed of boat in still water (u km/h) }
speed of stream (v km/h) } ($u > v$)



CLOCKS



Minute hand

$$60 \text{ min} \longrightarrow 360^\circ$$

$$1 \text{ min} \longrightarrow \frac{360^\circ}{60} = 6^\circ$$

Hour hand

$$12 \text{ h} \longrightarrow 360^\circ$$

$$1 \text{ h} \longrightarrow 30^\circ$$

$$60 \text{ min} \longrightarrow 30^\circ$$

$$1 \text{ min} \longrightarrow \frac{30^\circ}{60} = \frac{1^\circ}{2}$$

Find the angle traced by hour hand from 5:15 PM to 8:24 PM.

$$\underline{3 \text{ h}} \qquad \underline{9 \text{ min}}$$

$$30^\circ \times 3 + 9 \times \left(\frac{1}{2}\right)^\circ$$

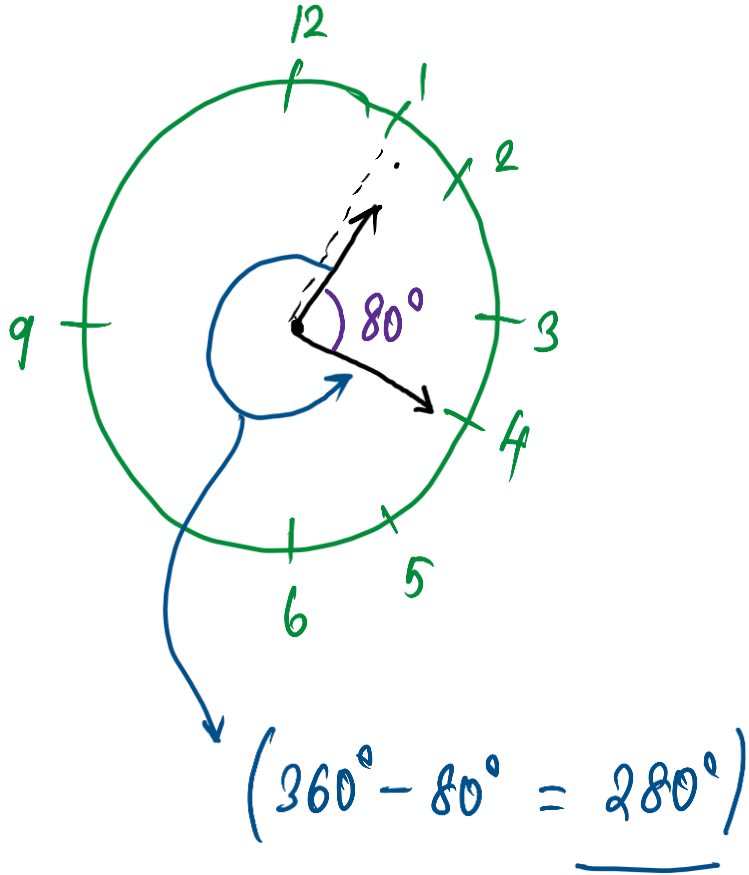
$$90^\circ + \left(\frac{9}{2}\right)^\circ = \underline{94.5^\circ}$$

ANGLE BETWEEN MINUTE AND HOUR HAND AT A CERTAIN TIME

$$\theta = \frac{11m - 60h}{2}$$

if θ comes -ve, make it +ve.

Find the angle between the hands of a clock when the time is 1:20 PM ?



$$\theta = \frac{11m - 60h}{2} = \frac{(11 \times 20) - (60 \times 1)}{2}$$

$$= \frac{220 - 60}{2} = \frac{160}{2} = \underline{80^\circ}$$



0°

hands coincide

1 hr \rightarrow 1

12 hr \rightarrow 11

24 hr \rightarrow 22



180°

opposite

1 hr \rightarrow 1

12 hr \rightarrow 11

24 hr \rightarrow 22



90°

right angle to each other

1 hr \rightarrow 2

12 hr \rightarrow 22

24 hr \rightarrow 44

In one day (24 hours), hour hand and minute hand,

① coincide — 0° — 22 times

② opposite to each other — 180° — 22 times

③ at right angles to each other — 90° — 44 times

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MISCELLANEOUS TOPICS

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