

Data Interpretation



~ Quantitative Aptitude · SSC Exams ~

← circled = key formulas!



DI means reading a table/graph/chart and pulling out facts using simple maths. Master the **chart-reading rules** + a few % & ratio formulas — DI is **marks-guaranteed** if you stay careful with units!

① What is DI? — Meaning & Basic Tools 🔍

Data Interpretation is the act of **organising and interpreting data** to get meaningful information. A large volume of data is compressed into a **compact, precise form** (table/graph/chart) which is far easier to read than raw data.

• **Basic tools** needed to solve DI → **Calculation, Average, Ratio, Percentage**. Nothing new — just applying old concepts to a chart.

Remember — Core DI Formulae

- % increase = $(\text{Final} - \text{Initial}) / \text{Initial} \times 100$
- % decrease = $(\text{Initial} - \text{Final}) / \text{Initial} \times 100$
- Qty I is what % of Qty II = $(I / II) \times 100$
- Qty I is what % less than Qty II = $(II - I) / II \times 100$
- Qty I is what % more than Qty II = $(I - II) / II \times 100$
- Central angle of a component = $(\text{Value of component} / \text{Total value}) \times 360^\circ$

Worked example — find the % increase

A shop's sales rose from ₹4,00,000 in 2022 to ₹5,00,000 in 2023.

Step 1 — increase = $5,00,000 - 4,00,000 = 1,00,000$.

Step 2 — % increase = $1,00,000 / 4,00,000 \times 100$.

Answer → = **25%**. ✓

Try these — one-line facts

80 is what % of 100? → **80%**

Value=50, Total=200 → angle = **90°**

250→200: % decrease? → **20%**

Qty I=45, Qty II=60 → I is **25%** less



DI has no new maths – only reading skill. 90% of the difficulty is misreading axis units (thousands vs lakhs) or missing a “not” in the question.

② Reading Tables – Averages & Ratios

Rows = categories, columns = parameters. Read **row****x****column** intersections carefully, and always note the **unit in the title** (units, ₹, '000, lakh...).

Company	Q1	Q2	Q3	Q4
A	120	150	130	160
B	100	140	160	150
C	180	170	190	200
D	90	110	100	120

Table — mobile phones sold (in units) by 4 companies over 4 quarters.

Worked example — average quarterly sales of A

Step 1 — Total = $120+150+130+160 = 560$.

Step 2 — Average = $560 / 4$.

Answer → = **140 units**. 

Try these

- Total sales of C (all quarters) = $180+170+190+200 = 740$ — the highest total of all 4 companies.
- Ratio of B's Q2 sales to D's Q2 sales = $140:110 = 14:11$.

Remember — table rules

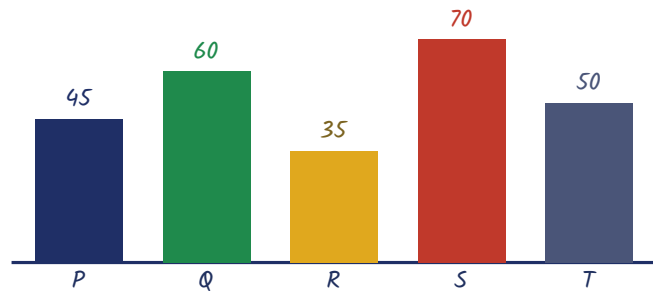
Row total = sum **across** a row · Column total = sum **down** a column · Grand total = sum of all cells.



Trap → SSC CGL 12/09/2025: 230 engineers — Python&Java=60, Python-only=70, Java-only=80, neither=20. "Proficient in Python" = $60+70=130$ (Python&Java + Python-only, not just one!).
Java=60+80=140. Ratio = **130:140 = 13:14**. 

③ Bar Graphs – Reading & Basics

Bar height (or length) is **directly proportional** to the value. Always check the y-axis scale first — is it “in hundreds”, “in ₹ lakh”, etc.?



Books sold by 5 stores in a week (in hundreds)

Remember – bar-graph rules

Compare bar heights **visually first** for “highest/lowest” questions — calculate only when an exact number is asked.

Worked example – total books sold

Step 1 — add all bars: $45 + 60 + 35 + 70 + 50 = 260$ (hundred).

Step 2 — convert units: 260×100 .

Answer → = **26,000 books**. 

Worked example – S vs R, % more

Step 1 — difference = $70 - 35 = 35$.

Step 2 — % more = $35 / 35 \times 100$.

Answer → Store S sold **100%** more books than R. 



“X% more than” always divides by the **smaller (base)** value; “X% less than” divides by the **larger** value. Mixing these up is the #1 DI error.

④ Bar Graphs – More Solved Qs

Continuing with the **same chart** from page 3 (books sold by stores P,Q,R,S,T – in hundreds: 45,60,35,70,50).

Worked example – average books per store

Step 1 – total = 260 (hundred), number of stores = 5.

Step 2 – average = $260 / 5 = 52$ (hundred).

Answer → = **5,200 books**. ✓

Worked example – ratio Q : T

Step 1 – Q = 60, T = 50.

Step 2 – simplify 60:50 by HCF 10.

Answer → = **6 : 5**. ✓

Try these

- Fewest books sold → Store **R (35 hundred)**.
- Combined sales of P & Q = $45+60 = 105$ hundred = **10,500**.
- T's share of total = $50 / 260 \times 100 \approx 19.2\%$.

Remember – grouped & stacked bars

- **Grouped bars** → two/more bars per category (e.g. Boys & Girls side by side) – read the **legend colour** carefully.
- **Stacked bars** → segments piled on **ONE** bar – the segment's value is the **difference of its two boundary lines**, not its top value.

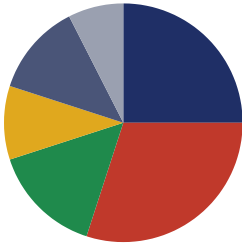


Speed tip → scan all bar-top values once and jot them down beside the chart – then every sub-question becomes pure arithmetic, no re-reading.

⑤ Pie Charts – Value ↔ Central Angle 🕒

Remember – the master link

- Value of a slice = $(\text{Central angle} / 360^\circ) \times \text{Total value}$
- Central angle = $(\text{Value of slice} / \text{Total value}) \times 360^\circ$
- % of slice = $(\text{angle} / 360^\circ) \times 100 = (\text{value} / \text{total}) \times 100$



■ Food	— 90° · 25% · ₹10,000
■ Rent	— 108° · 30% · ₹12,000
■ Education	— 54° · 15% · ₹6,000
■ Transport	— 36° · 10% · ₹4,000
■ Savings	— 45° · 12.5% · ₹5,000
■ Others	— 27° · 7.5% · ₹3,000

Monthly expenses of a family — Total = ₹40,000

Worked example – find Rent's central angle

Step 1 — Rent's share = $12,000 / 40,000 = 30\%$.

Step 2 — angle = $30\% \times 360^\circ$.

Answer → = **108°**. ✓

Worked example – Education spend from its angle (54°)

Step 1 — fraction = $54 / 360 = 0.15$.

Step 2 — value = $0.15 \times 40,000$.

Answer → = **₹6,000**. ✓

⑥ Pie Charts – Central Angle Problems

Continuing with the family-expenses pie chart from page 5 (Total = ₹40,000).

Worked example – ratio Food : Transport

Step 1 – Food = ₹10,000, Transport = ₹4,000.

Step 2 – simplify 10,000:4,000 by HCF 2,000.

Answer → = **5 : 2**. ✓

Worked example – Savings as % of Rent

Step 1 – Savings / Rent = 5,000 / 12,000 = 5/12.

Step 2 – $\times 100 = 500/12$.

Answer → $\approx$ **41.67%**. ✓

Worked example – central-angle difference

Two components have angles 72° and 108° ; total value = 900.

Step 1 – value1 = $72/360 \times 900 = 180$; value2 = $108/360 \times 900 = 270$.

Answer → difference = $270 - 180 = 90$. ✓

Quick pie conversions

$$90^\circ = 25\%$$

$$120^\circ = 33.33\%$$

$$60^\circ = 16.67\%$$

$$36^\circ = 10\%$$

$$180^\circ = 50\%$$

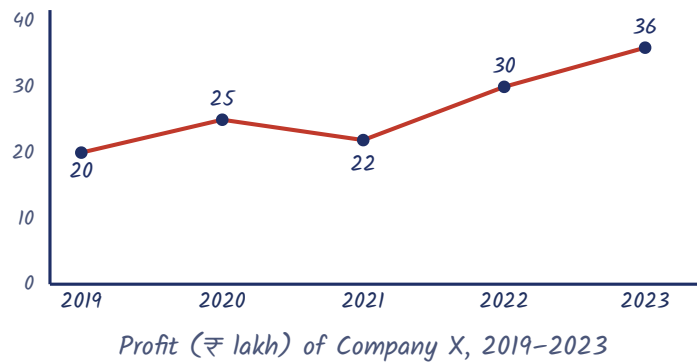
$$270^\circ = 75\%$$



All central angles of a pie chart must add to 360° – a quick way to self-check that you have read every slice correctly.

⑦ Line Graphs – Reading & Growth %

A line graph plots values over time. **Slope** tells the trend — steeper up = faster growth, steeper down = faster fall.



Worked example – % increase 2019 → 2020

Step 1 — increase = $25 - 20 = 5$.

Step 2 — % = $5 / 20 \times 100$.

Answer → = **25%**. 

Worked example – % decrease 2020 → 2021

Step 1 — decrease = $25 - 22 = 3$.

Step 2 — % = $3 / 25 \times 100$.

Answer → = **12%**. 

⑧ Line Graphs – More Solved Qs

Continuing with the profit line graph from page 7 (2019–2023: 20, 25, 22, 30, 36 ₹ lakh).

Worked example – overall % growth 2019→2023

Step 1 – compare LAST year to FIRST year: $36 - 20 = 16$.

Step 2 – $\% = 16 / 20 \times 100$.

Answer → = **80%**. ✓

Worked example – average profit over 5 years

Step 1 – sum = $20+25+22+30+36 = 133$.

Step 2 – average = $133 / 5$.

Answer → = **₹26.6 lakh**. ✓

Try these

- Largest year-on-year jump → 2021→2022 (22→30, +8) – year **2022**.
- Lowest profit year → **2019 (₹20 lakh)**.
- Ratio of 2023 profit to 2019 profit = $36:20 = 9:5$.



Trap → “Overall % growth” always compares the *last point to the first point*, never year-to-year totals. Also watch for a *dual-axis* line graph where a second line uses a different scale.



A falling segment between two rising ones is common in SSC line graphs – don't assume growth is always positive; read every segment's sign separately.

⑨ Percentage, Ratio, Average & Total

Remember – every DI question reduces to these

- Total = Σ (individual values)
- Average = Total / Number of items
- Ratio of A to B = A : B (simplify by their HCF)
- % share of a part = (Part / Total) $\times$ 100

Worked example – SSC CGL 13/09/2025, Shift 1

Worker C's daily wages (Mon–Thu): ₹220, ₹230, ₹215, ₹225.

Step 1 – total = $220+230+215+225 = 890$.

Step 2 – average = $890 / 4$.

Answer → = ₹222.5. 

Worked example – SSC CGL 15/09/2025, Shift 1

Salesperson Q's weekly sales (₹000, Mon–Thu): 75, 64, 62, 68.

Step 1 – total = $75+64+62+68 = 269$.

Step 2 – average = $269 / 4$.

Answer → = ₹67.25 (thousand). 

Try these

P's sales 40,60,50,55 → avg = 51.25

5 items sum to 250 → avg = 50



"Overall average" of two groups is **NOT** the average of their two averages unless the group sizes are equal – always go back to total/count.

⑩ Percentage Change & Growth % ↗

Remember – successive % change

- % change = $(\text{New} - \text{Old}) / \text{Old} \times 100$ (+ve = increase, -ve = decrease)
- Two successive changes $a\%$ then $b\%$: net % change = $a + b + (ab / 100)$
(use negative sign for a decrease, e.g. a decrease of 10% $\rightarrow a = -10$)

Worked example – +20% then -10%

Step 1 – $a = 20, b = -10$.

Step 2 – net = $20 + (-10) + (20 \times -10) / 100 = 10 - 2$.

Answer $\rightarrow$ net = **8% increase**. ✓

Worked example – sales +25% then +20%

Step 1 – $a = 25, b = 20$.

Step 2 – net = $25 + 20 + (25 \times 20) / 100 = 45 + 5$.

Answer $\rightarrow$ overall growth = **50%**. ✓

Quick successive-change pairs

10% & 10% $\rightarrow$ **21%**

20% & -20% $\rightarrow$ **-4%**

-10% & -10% $\rightarrow$ **-19%**



A rise of $x\%$ followed by a fall of $x\%$ (same number) is **never** zero – it's always a net fall of $x^2/100$ % (base changed after the first step).

11 Caselet & Mixed DI

Caselet DI gives data as a paragraph, not a chart. Read carefully, build your own **mini-table** from the numbers, then solve as usual. **Mixed DI** = one question set built from **two charts together** (e.g. a bar graph + a pie chart) — always check which chart a sub-question refers to.

Caselet – a company's IT department

A company has 600 employees; 60% are male and the rest female. 25% of male employees and 25% of female employees work in the IT department; the rest work in other departments.

Step 0 – build the mini-table first

$$\text{Male} = 600 \times 60\% = 360 \quad \cdot \quad \text{Female} = 600 - 360 = 240$$

$$\text{Male in IT} = 360 \times 25\% = 90 \quad \cdot \quad \text{Female in IT} = 240 \times 25\% = 60$$

Q1. Total employees in the IT department?

$$90 + 60 = 150 \text{ employees. } \checkmark$$

Q2. Ratio of male : female NOT in IT?

$$\text{Male not-IT} = 360 - 90 = 270; \text{ Female not-IT} = 240 - 60 = 180 \rightarrow 270:180 = 3:2. \checkmark$$

Q3. IT department as % of total company?

$$150 / 600 \times 100 = 25\%. \checkmark$$



In caselets, converting **words to numbers** is 80% of the work — once your mini-table is ready, the questions are pure DI.

12 Approximation & Elimination 🔍

Remember – speed tricks

- Round values to a clean number before dividing (e.g. $4,987 \approx 5,000$).
- In “% of” MCQs, options usually differ by 2–3% — rounding is safe.
- **Eliminate** obviously too-big/too-small options first, especially in ratio/average MCQs.

Worked example – 787 is what % of 3,168?

Step 1 — round: $787 \approx 800$, $3,168 \approx 3,200$.

Step 2 — $800 / 3,200 = 0.25$.

Answer → $\approx$ **25%** (exact = 24.84%, close enough to pick the right option). 

Fraction ↔ % ready-reckoner

$$1/2 = 50\%$$

$$1/3 = 33.3\%$$

$$1/4 = 25\%$$

$$1/5 = 20\%$$

$$1/6 = 16.7\%$$

$$1/7 = 14.3\%$$

$$1/8 = 12.5\%$$

$$1/9 = 11.1\%$$

$$1/10 = 10\%$$

$$1/11 = 9.1\%$$

$$1/12 = 8.3\%$$

$$1/20 = 5\%$$



Never do exact long division under time pressure — round to 1 significant figure and estimate; then match the **closest** option.



If two options are very close (e.g. 24% vs 25%), only **THEN** switch to exact calculation — don't waste time being precise everywhere.

13 Common Traps in DI ⚠

The five classic DI traps

- ① **Units trap** — chart says “in ‘000” or “in lakh”; forgetting to multiply back gives an answer wrong by orders of magnitude.
- ② **“Of which”/“including” trap** — the sub-group is a **subset**, not a separate quantity (see page 2).
- ③ **Cumulative vs individual** — a running-total graph needs subtraction to get one period’s own value.
- ④ **“At least/at most” wording** — changes which rows/columns to include or exclude.
- ⑤ **Dual-axis charts** — two y-axes (e.g. bars in units, line in %) must never be read against the same scale.

Worked example — cumulative trap

Cumulative sales (₹ lakh): 2020 = 50, 2021 = 90, 2022 = 150.

Step 1 — 2022’s own sales = cumulative(2022) – cumulative(2021).

Step 2 — = 150 – 90.

Answer → = ₹60 lakh. ✓

Worked example — units trap

A bar shows the value “45” and the chart title says (in hundreds).

Step 1 — multiply back: 45×100 .

Answer → = 4,500 actual units. ✓



Recap trap ② (page 2) — “Proficient in Python” = Python&Java + Python-only = 60+70 = 130, **not** just 70. Always add the overlap back in.

Solved Examples

Q1. SSC CGL 13/09/2025 – Team A rounds 44,35,41; Team B rounds 46,55,49. Which has the higher average?

A: $(44+35+41)/3 = 40$. B: $(46+55+49)/3 = 50$. → **Team B.** 

Q2. From the bar chart (page 3), store P's share of total sales?

$45 / 260 \times 100 \approx 17.3\%$. 

Q3. From the pie chart (page 5), ratio of Education to Savings spend?

$6,000 : 5,000 = 6 : 5$. 

Q4. A value rises $40 \rightarrow 50$ then falls back $50 \rightarrow 40$. Find the % decrease in the second step.

decrease = 10; % = $10/50 \times 100 = 20\%$. 

Q5. A number is increased by 10%, then by 10% again. Overall % increase?

net = $10+10+(10 \times 10)/100 = 20+1 = 21\%$. 

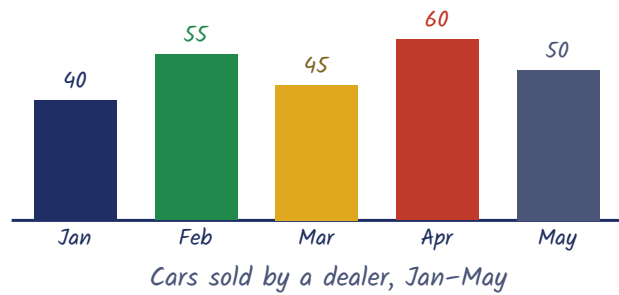
Q6. Two numbers are in ratio 3:5 and their average is 40. Find the numbers.

Let numbers = $3x, 5x \rightarrow (3x+5x)/2 = 4x = 40 \rightarrow x = 10 \rightarrow 30 \text{ and } 50$. 



Notice how every question here is really just percentage, ratio or average in disguise – the chart only decides which numbers to plug in.

DI Exercise



- Q1. Total cars sold in the 5 months? (a) 230 (b) 245 (c) 250 (d) 260
Q2. In which month were sales highest? (a) Jan (b) Feb (c) Apr (d) May
Q3. % increase in sales from Jan to Feb? (a) 25% (b) 30% (c) 37.5% (d) 40%
Q4. Average monthly sales over the 5 months? (a) 45 (b) 48 (c) 50 (d) 55
Q5. Ratio of March sales to May sales? (a) 9:10 (b) 10:9 (c) 4:5 (d) 5:4
Q6. April sales is what % more than Jan sales? (a) 40% (b) 50% (c) 45% (d) 60%

Answer Key – with working

1 → (c) 250 ($40+55+45+60+50$) · 2 → (c) Apr (60 is the tallest bar) · 3 → (c) 37.5%
($(55-40)/40 \times 100$) · 4 → (c) 50 ($250/5$) · 5 → (a) 9:10 ($45:50$) · 6 → (b) 50%
($(60-40)/40 \times 100$).



Attempt this exercise *without a calculator* first, timing yourself – DI sets in the real exam must be cracked in under 6 minutes for 4–5 questions.

Practice Set

1. Qty rises 200→250. % increase?
2. Pie component = 15% of total → angle?
3. Pie value 9,000, total 36,000 → %?
4. Table items 10,20,30,40 → average?
5. Simplify ratio 60:90.
6. Cumulative 2020=80, 2021=140 → 2021's own value?
7. Qty falls 500→400. % decrease?
8. Successive +20% & +25% → net %?
9. Express $1/8$ as a percentage.
10. Bar shows "36 (in thousands)" → actual value?
11. I=45, II=60 → I is what % less than II?
12. Angles 90°,120°,150°, total=720 → largest value?

Answer Key – with working

1→ 25% ($50/200$) · 2→ 54° ($15\% \times 360$) · 3→ 25% ($9000/36000$) · 4→ 25 ($100/4$) · 5→ 2:3 (HCF 30) · 6→ 60 ($140-80$) · 7→ 20% ($100/500$) · 8→ 50% ($20+25+5$) · 9→ 12.5% · 10→ 36,000 (36×1000) · 11→ 25% ($15/60$) · 12→ 300 ($150/360 \times 720$).

Quick Revision

- ✓ DI = reading tool (table/bar/pie/line/caselet) + basic maths (% , ratio, average, total). Always check the UNITS in the title first.
- ✓ Pie: $\text{value} = (\text{angle} / 360) \times \text{total}$; $\text{angle} = (\text{value} / \text{total}) \times 360$; all angles sum to 360°. Bar/Line: compare heights/slope directly before calculating exactly.
- ✓ Successive % change = $a+b+(ab/100)$; "of which" = subset not separate; cumulative graphs need subtraction for an individual period's value.

☆ DI is just reading + basic maths – practice charts daily! ☆

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