

Percentage

intro

1. 2024-08-08



PERCENTAGE
LESSON #1 Introduction

$* 9400$ $\text{③ } 30\% \text{ of } 2800 = ?$ $\frac{30}{100} \times 2800 = ?$ $= 28 \times 30$ $= [840]$	$\text{① } 50\% \text{ of } 2800 = ?$ $\frac{50}{100} \times 2800 = ?$ $= 50 \times 28$ $= [1400]$	<u>Normal Method</u> <u>Mind Calculation</u>
$\text{② } 10\% \text{ of } 2800 = ?$ $\frac{10}{100} \times 2800 = ?$ $= [280]$		$\text{① } 50\% = 1400$ $\text{② } 10\% = 280 \times 3 = [840]$ $\text{③ } 1\% = 28$ $\text{④ } 5\% = 140 \times 5 = [35\%]$ $\text{⑤ } 20\% = 560$ $\text{⑥ } 30\% + 5\% = [35\%]$ $\frac{840}{140}$ $\frac{140}{980}$

(a)

formula basics just memory it



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LESSON #1 Introduction

$\text{Eq. } * [X\% \text{ of } Y = Y\% \text{ of } X]$ $\text{Ex. } 36\% \text{ of } 50 = ?$ $\frac{36}{100} \times 50 = ?$ $= [18]$	$20\% \text{ of } 96 = ?$ $10\% = 9.6$
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(b) i.

Fraction	Decimal	Percentage
1	1	100%
$\frac{3}{4}$	0.75	75%
$\frac{2}{3}$	0. $\dot{6}$	66. $\dot{6}$ %
$\frac{1}{2}$	0.5	50%
$\frac{1}{3}$	0. $\dot{3}$	33. $\dot{3}$ %
$\frac{1}{4}$	0.25	25%
$\frac{1}{5}$	0.2	20%
$\frac{1}{8}$	0.125	12.5%
$\frac{1}{10}$	0.1	10%
$\frac{1}{100}$	0.01	1%

basic question

PERCENTAGE
LESSON 2 BASIC QUESTIONS

$\frac{50}{100}$ of P = $\frac{25}{100}$ of Q
 $\frac{P}{2} = \frac{Q}{4}$ then
 $P = x\% \text{ of } Q$ find x.

$2P = 1Q$
 $P = \frac{Q}{2}$

$\frac{Q}{2} = \frac{x}{100} \times Q$
 $x = 50$

1. (a)

If $50\% \text{ of } P = 25\% \text{ of } Q$,
then $P=x\% \text{ of } Q$. find x.

(a) 0.5
(b) 20
(c) 50
(d) 30
(e) 10

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LESSON 2 BASIC QUESTIONS

② $20\% \text{ of } (P+Q) = 50\% \text{ of } (P-Q)$

$2(P+Q) = 5(P-Q)$
 $2P + 2Q = 5P - 5Q$
 $2Q + 5Q = 5P - 2P$
 $7Q = 3P$
 $\frac{P}{Q} = \frac{7}{3} \Rightarrow P:Q = 7:3$

(b) i.

If $20\% \text{ of } (P+Q) = 50\% \text{ of } (P-Q)$, then
find P : Q

(a) 7:8
(b) 7:3
(c) 7:5
(d) 5:7
(e) 1:5

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LESSON 2 BASIC QUESTIONS

(3)

$$\begin{aligned} \frac{90}{3} \text{ of } A &= \frac{30}{1} \text{ of } B \\ B &= 2x\% \text{ of } A \quad \text{find } x \\ 3A &= B \\ A &= \frac{B}{3} \\ B &= \frac{2x}{100} \times \frac{B}{3} \\ 1 &= \frac{x}{150} \\ x &= 150 \end{aligned}$$

ii. A.

If 90% of A = 30% of B
and B = 2x% of A, then
the value of x is

- (a) 450
- (b) 400
- (c) 300
- (d) 150
- (e) 105

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LESSON 2 BASIC QUESTIONS

(4)

$$\begin{aligned} 40\% \text{ of } (A+B) &= 60\% \text{ of } (A-B) \\ \text{then } \frac{2A-3B}{A+B} &\approx \\ \frac{2}{4}(A+B) &= \frac{3}{6}(A-B) \\ \frac{2(5B)-3B}{5B+B} &= 2A+2B=3A-3B \\ 10B-3B &= 2B+3B=3A-2A \\ \frac{7B}{6B} &= \frac{5B}{6B} \quad [5B=A] \\ \frac{7}{6} &= \frac{1}{6} \end{aligned}$$

iii.

If 40% of (A + B) = 60%
of (A - B) then
(2A-3B)/(A+B) is

- (a) 7/6
- (b) 6/7
- (c) 5/6
- (d) 6/5
- (e) 1/5

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LESSON 2 BASIC QUESTIONS

(5)

$$\begin{aligned} 20\% \text{ of } a &= 80\% \text{ of } b \\ \text{find } \frac{b+a}{b-a} \\ \frac{2}{4}a &= \frac{8}{4}b \\ a &= 4b \\ \frac{b+4b}{b-4b} &= \frac{5b}{3b} = \frac{5}{3} \end{aligned}$$

iv.

If 20% of a is equal to
80% of b, then
(b+a)/(b-a) is equal to

- (a) 3/5
- (b) 5/3
- (c) 5/7
- (d) 7/5
- (e) 1/5

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LESSON 2 BASIC QUESTIONS

20% of $(A+B) = 50\%$ of B
then $\frac{2A+B}{2A+2B} \&$

$$2(A+B) = 5B$$

$$2A+2B = 5B$$

$$2A = 5B - 2B$$

$$2A = 3B$$

$$\boxed{A = \frac{3B}{2}}$$

$$\frac{2B}{2B} = \frac{1}{2}$$

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v.

If 20% of $(A + B) = 50\%$ of B , then the value $(2A-B)/(2A+B)$ is

- (a) 1/2
- (b) 1/3
- (c) 1/4
- (d) 1
- (e) 1/5

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LESSON 2 BASIC QUESTIONS

④ If x is 20% less than y
 $\frac{y-x}{y}$ and $\frac{x}{x-y}$

$x = 80$ $y = 100$

$$\frac{100-80}{100}, \frac{80}{80-100}$$

$$\frac{20}{100} = \frac{2}{10} = \frac{1}{5}$$

$$\frac{80}{-20} = \frac{4}{-1} = -4$$

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vi.

If X is 20% less than Y , then find the value of $(Y-X)/Y$ and $X/(X-Y)$

- (a) 1/5, -4
- (b) 5, -1/4
- (c) 2/5, -5/2
- (d) 3/5, -5/3
- (e) 2/5, -3/4

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LESSON 2 BASIC QUESTIONS

⑤ If $\frac{8}{2}\%$ of $x = \frac{4}{1}\%$ of y , then
 $2x = y$
 $\boxed{x = \frac{y}{2}}$

20% of x is
 $\frac{20}{100} \times \frac{y}{2} = \frac{y}{10}$

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vii.

If 8% of $x = 4\%$ of y , then
20% of x is

- (a) 10% of y
- (b) 16% of y
- (c) 40% of y
- (d) 80% of y
- (e) 30% of y

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LESSON 2 BASIC QUESTIONS

Q) $\frac{60}{2}\%$ of A = $\frac{30}{1}\%$ of B, B = 40% of C,
 $C = x\%$ of A
 Then find
 $\frac{A}{B} = \frac{B}{C}$
 $\frac{A}{B} = \frac{40}{5} \times C$
 $A = \frac{C}{5}$ $x = \frac{x}{100} \times \frac{C}{5}$
 $x = 500$

viii.

If 60% of A = 30% of B,
 B=40% of C, C =x% of A,
 then the value of x
 is

(a)200
 (b)500
 (c)800
 (d)300
 (e)100

percentage new basics

PERCENTAGE
LESSON 3 What Percentage

x y
 (100) (100)
 $\frac{y-x}{x} \times 100$

$\frac{100}{11} \text{ less}$

1. (a)

If x is 10% more than y,
 then by what percent is
 y less than x?

(a) $9(1/11)\%$
 (b) $7(1/11)\%$
 (c) $8(1/11)\%$
 (d) $10(1/11)\%$
 (e) $12(1/11)\%$

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LESSON 3 What percentage

$$\frac{x}{10} \quad \frac{y}{100}$$

$$\frac{100 \text{ less}}{11} \quad \frac{10\%}{110}$$

$$\frac{y-x}{x} \times 100 = \frac{-10}{110} \times 100 = \boxed{\frac{-100}{11}}$$

(b)

If x is 10% more than y ,
then by what percent is
 y less than x ?

- (a) $9(1/11)\%$
- (b) $7(1/11)\%$
- (c) $8(1/11)\%$
- (d) $10(1/11)\%$
- (e) $12(1/11)\%$

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PERCENTAGE

LESSON 3 What percentage

$$\frac{A}{10} \quad \frac{B}{100}$$

$$\text{than/of}$$

$$= \frac{B-A}{A} \times 100$$

$$= \frac{100-110}{110} \times 100 \Rightarrow \frac{-10}{110} \times 100 = \boxed{\frac{-100}{11}}$$

(c)

If A's height is 10%
more than B's height,
by how much percent
less is B's height that
of A?

- (a) 10%
- (b) $10(1/9)\%$
- (c) $10(1/11)\%$
- (d) $9(1/11)\%$
- (e) 15%

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LESSON 3 What percentage

A (100)	B (80)
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$$\begin{aligned}
 &= \frac{A - B}{B} \times 100 \\
 &= \frac{100 - 80}{80} \times 100 \\
 &= \frac{20}{80} \times 100 = 25\%
 \end{aligned}$$

(d) 

- B got 20% marks less than A. what percent marks did A got more than B?**
- (a) 20%
 - (b) 25%
 - (c) 12%
 - (d) 80%
 - (e) 90%

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LESSON 3 What percentage

x (125)	y (100)
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$$\begin{aligned}
 &= \frac{Y - X}{X} \times 100 \\
 &= \frac{100 - 125}{125} \times 100 = -20\% \text{ less} \\
 &= -25\% \times 100
 \end{aligned}$$

(e) 

- If x earns 25% more than y. What percent less does y earn than x?**

- (a) 16%
- (b) 10%
- (c) 20%
- (d) 25%
- (e) 11%

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LESSON 3 What Percentage

$$\begin{array}{ccc} \overline{12\frac{1}{2}\%} & \overline{25\%} & \overline{} \\ (\underline{225}) & (\underline{125}) & (\underline{100}) \end{array}$$

$$\begin{array}{c} \frac{25}{225} \times 100 \\ = \frac{100+25}{2} \\ = \frac{225}{2} \end{array}$$

(f) i.

Two numbers are respectively $12\frac{1}{2}\%$ and 25% more than a third number. The first number is what percentage of second number is

- (a) 50
- (b) 60
- (c) 75
- (d) 90
- (e) 25

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LESSON 3 What Percentage

$$\begin{array}{ccc} \overline{12\frac{1}{2}\%} & \overline{25\%} & \overline{} \\ (\underline{225}) & (\underline{125}) & (\underline{100}) \end{array}$$

$$\begin{array}{c} \frac{225}{125} \times 100 \\ = \frac{9}{5} \times 100 \\ = 180 \end{array}$$

ii.

Two numbers are respectively $12\frac{1}{2}\%$ and 25% more than a third number. The first number is what percentage of second number is

- (a) 50
- (b) 60
- (c) 75
- (d) 90
- (e) 25

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LESSON 3 What Percentage

$\frac{30\%}{(70)} \quad \frac{37\%}{(63) (100)}$

$$\begin{aligned} & \frac{S - F}{F} \times 100 \\ & \frac{63 - 70}{70} \times 100 \\ & = \frac{-7}{70} \times 100 \\ & = -10\% \text{ less} \end{aligned}$$

(g)

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Two numbers are less than a third number by 30% and 37% respectively. The percent by which the second number is less than the first is

- (a) 10
- (b) 7
- (c) 4
- (d) 3
- (e) 2

on salary

Base value, remaining, balance, at below change rps from starting of %

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LESSON 4 Based on Salary

$$\begin{aligned} \frac{100\%}{\text{Base Value}} - \underbrace{40\% - 20\% - 10\% - 10\%}_{\text{Spends.}} &= 80\% \\ 20\% &= 1500 \\ 100\% &= x \\ x \times 20\% &= 1500 \times 10\% \\ x &= 7500 \end{aligned}$$

1. (a)

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Radha spends 40% of her salary on food, 20% on house rent, 10% on entertainment and 10% on conveyance. If her savings at the end of a month are Rs.1500, then her salary per month (in Rs.) is

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LESSON 4 Based on Salary

$\frac{100\%}{30\%}$
 $\frac{30\%}{3\%}$
 $\frac{3\%}{33\%}$

$33\% = 2310$
 $100\% = x$
 $33 \times x = 2310 \times 100$
 $x = 7000$

2. (a) 

Kishan spends 30% of his salary on food and donates 3% in a Charitable Trust. He spends Rs.2310 on these two items, then total salary for that month is

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2. (a)

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LESSON 4 Based on Salary

$\frac{100\%}{35\%}$
 $\frac{35\%}{5\%}$
 $\frac{5\%}{40\%}$
 $\frac{40\%}{44}$

$40\% = 17600$
 $100\% = x$
 $x = 44000$

3. (a) 

Mr. X spends 35% of his salary on food 5% of his salary on children education. In January 2011, he spent Rs.17600 on these two items. His salary for that month is

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3. (a)

LESSON 4 Based on Salary

$\frac{55475}{28525}$ $\frac{25\%}{Savings}$

$75\% = \frac{84000}{84000}$

$75\% = 84000$
 $100\% = x$
 $75 \times x = 84000 \times 100$
 $x = 112000$

4. (a) 

Keshav spent Rs.55475 on his birthday party, Rs.28525 on buying home appliances and the remaining 25% of the total amount he had as cash with him. What was the total amount?

4. (a)

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LESSON 4 Based on Salary

1. $\frac{7}{100}x = 2710$
 $100\% = x$
 $x = 31000 \rightarrow \text{Suj. Salary}$

2. 100%
 $\rightarrow 7\% + 18\% + 6\%$
 $31\% \quad 100\% = 31000$
 $31\% = x$
 $x = 310 \times 31$
 $x = 9610 \times 12$

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5. (a)

Ms. Sujata invests 7% i.e., Rs.2710, of her monthly salary in mutual fund. Later she invests 18% of her monthly salary in recurring deposits. Also, she invests 6% of her salary on NSC's. What is the total annual amount invested by Ms. Sujata?

6. remaining is important in the question , so it may be hard so base is rps 100 , **OUT OF** ,remaining

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LESSON 4 Based on Salary

1. $\frac{20}{100} \text{ of } 100 = 20(\text{Hs})$
 $\text{Rs. } 80$

2. $65\% \text{ of } 80$
 $\frac{65}{100} \times 80 = 52$

3. $28\% = 9800$
 $100\% = x$
 $x = \frac{9800 \times 100}{28}$
 $x = 35,000$

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(a)

Mr.X spends 20% of his monthly income on household expenditure. Out of the remaining 25% he spends on children's education, 15% on transport, 15% on medicine and 10% on entertainment. He is left with Rs.9800 after incurring all these expenditures. What is his monthly income?

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LESSON 4 Based on Salary

A man spends 40% of his monthly salary on food and one-third of the remaining on transport. If he saves Rs.4500 per month, which is equal to half the balance after spending on food and transport, his monthly salary is

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7. (a)

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LESSON 4 Based on Salary

A person gave 20% of his income to his elder son, 30% of the remaining to the younger son and 10% of the balance, he donated to a trust. He is left with Rs.10080. His income was:

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8. (a)

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LESSON 4 Based on Sabey

$$\frac{3}{100} \times x = \frac{(40,000 - x) \times 15}{100}$$

$$3x = 40,000 - x$$

$$4x = 40,000$$

$$x = 10,000$$


9. (a)

10. ==new format ==

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LESSON 4 Based on Sabey

$$125\% \text{ of } 12\% \text{ of } x = 2400$$

$$\frac{25}{100} \times \frac{12}{100} \times x = 2400$$

$$\frac{30}{20} \times 4 \times x = 2400$$

$$x = 2 \times 100 \times 20 \times 4$$

$$x = 16,000$$


(a)

The monthly salaries of A and B together amount to Rs. 40000. A spends 85% of his salary and B, 95% of his salary. If now their savings are the same, then the salary (in Rs.) of A is

Vipul decided to donate 12% of his salary to an orphanage. On the day of donation, he changed his mind and donated Rs.2400 which was 125% of what he had decided earlier. How much is Vipul's salary?

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voters

important points

1. won
 2. by majority of x differences votes , compared to others , meaning difference of win and losers
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LESSON #5 Based On Voters

$$\begin{array}{ccc} W & L & T.V \\ 57\% & 43\% & 100\% \end{array}$$

$$Maj = W\% \sim L\% = 57\% \sim 43\%$$

$$\begin{aligned} 14\% &= 42,000 & 14x &= 42,000 \times 100 \\ 100\% &= x & x &= \frac{42,000 \times 100}{14} \\ & & x &= 3,00,000 \end{aligned}$$

Two person contested an election of parliament. The winning candidate secured 57% of the total votes polled and won by a majority of 42,000. The total number of votes polled is.

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LESSON #5 Based On Voters

$$\begin{array}{ccc} T.V.P. & L & W \\ 100\% & 40\% \sim & 60\% \end{array}$$

$$\begin{aligned} 20\% &= 298 & 100\% &= x \\ 100\% &= x & x &= \frac{298 \times 100}{20} \\ x &= 1490 & & \end{aligned}$$

In a election, a candidate secured 40% of the votes but is defeated by the only other candidate by a majority of 298 votes. Find the total number of votes recorded.

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4. (a)

5. find the majority

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LESSON #5 Based On Voters

<u>Total Voter</u>	<u>W</u>	<u>L</u>
100%	72%	28%

$$\begin{array}{l} 100\% = 8200 \\ \downarrow \\ x = 3608 \end{array}$$

$$\begin{array}{l} 44\% = x \\ \downarrow \\ 100x = 8200 \times 44 \\ x = 8200 \times 44 \end{array}$$

(a)

In a election between two candidates, one get 72% of the total votes. If the total votes are 8200 by how many votes did the winner win the election?

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6. by the majority given , to find out the winning candidatet got by winning candidate so we use 60%

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LESSON #5 Based On Voters

<u>T.V.E</u>	<u>W</u>	<u>L</u>
100%	60% ~ 40%	

$$\begin{array}{l} 20\% = 14,000 \\ \downarrow \\ 60\% = x \\ \downarrow \\ 20x = 14,000 \times 60 \\ x = 42,000 \end{array}$$

(a)

In an election between two candidates, the candidate getting 60% of the votes polled is elected by a majority of 14,000 votes. The number of votes polled by the winning candidate is

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LESSON #5 Based On Voters

<u>T.N.E</u>	1	2	3
100%	40%	36%	24%

$$\begin{array}{rcl} 100\% & = & 36,000 \\ \downarrow & & \downarrow \\ 84\% & = & x \\ \hline 100x & = & 36,000 \times 24 \\ x & = & 360 \times 24 \\ x & = & 8640 \end{array}$$

In an election, three candidates contested. The first candidate got 40% votes and the second got 36% votes. If the total number of votes polled were 36000, find the number of votes got by the third candidate.

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7. (a) invalid votes

some are invalid, base is not change

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LESSON #5 Based On Voters

<u>Winner</u>	70% of 90%	<u>T.V.E</u>
	$\left(\frac{70}{100} \times 90\right)\%$	100% 10%
	63%	90% <u>Valid</u>

$$\begin{array}{rcl} 63\% - 27\% & = & 36\% \\ \hline \text{Majority} & = & 36\% \\ x & = & 1800 \end{array}$$

$$\begin{array}{rcl} 100\% & = & 50 \\ x & = & 1800 \times \frac{50}{36\%} \\ x & = & 5000 \end{array}$$

In a college election between two candidates, 10% of the votes cast are invalid. The winner gets 70% of the valid votes and defeats the loser by 1800 votes. How many votes were totally cast?

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1. (a)

LESSON #5 Based On Voters

T.V.E $\Rightarrow 100\% - 8\%$
 $= 92\%$

48% ~ 44%
Winner Loser

$48\% = \frac{1100}{100} = x$ $x = \frac{1100 \times 100}{48}$
 $x = 27,500$

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2. (a)

8% of the voters in an election did not cast their votes. In this election, there were only two candidates. The winner by obtaining 48% of the total votes defeated his contestant by 1100 votes. The total number of voters in the election was

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LESSON #5 Based On Voters

T.V.E $100\% - 2\% = 98\%$
Valid Votes

$539 \times (100+4) = 53900$ $\frac{53900}{8156} = 56056$

$55\% \text{ of } 98\% = \left(\frac{55 \times 98}{100}\right)\%$ $100x = 1,04,000$
 $53.9\% \rightarrow \underline{\text{Winner}}$ $539x = x = 56056$
 $x = 539 \times 104$

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3.

In an assembly election, a candidate got 55% of the total valid votes. 2% of the total votes were declared invalid. If the total number of voters is 104000, then the number of valid votes polled in favour of the candidate.

based on marks

base 100 marks\

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LESSON #6 Based on Marks

1000(B)	800(G)
/	
60% Passed	50% Passed
40% Failed	50% Failed

$$\Rightarrow 400(B) + 400(G) = 800(\text{Failed})$$

$$= \frac{400}{1800} \times 100 = 44.44\%$$

1. (a)

In an examination, there were 1000 boys and 800 girls. 60% of the boys and 50% of the girls passed. Find the percent of the candidates failed?

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LESSON #6 Based on Marks

<u>Pass</u>	<u>Cand</u>
<u>40%</u>	<u>220</u>
	<u>20</u>
	<u>240</u>
	→ Passed

$$40\% = 240$$

$$100\% = x$$

$$\frac{40}{100} \times x = \frac{240}{240} \times 100$$

$$x = 600$$

2. (a)

In an examination, a candidate must secure 40% marks to pass. A candidate, who gets 220 marks, fails by 20 marks. What are the maximum marks for the examination?

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LESSON #6 Based on Marks

36%
Pass mark
 $\frac{113}{85} = \frac{198}{x}$
 $x = 550$

$36\% = 198$
 $100\% = x$
 $36x = 198 \times 100$
 $x = \frac{198 \times 100}{36}$

3. (a)

For an examination, it is required to get 36% of maximum marks to pass. A student got 113 marks and failed by 85 marks. The maximum marks for the examination are:

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LESSON #6 Based on Marks

Pass
 $33\% \approx 25\% = 40$
 $8\% = 40$
 $100\% = x$
 $8x = 40 \times 100$
 $x = 500$

4. (a)

A student has to obtain 33% of total marks to pass. He got 25% of total marks failed by 40 marks. The number of total marks is:

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5. (a)

LESSON #6 Based on Marks

$$80\%(E) + 85\%(M) - 75\%(EM) = 90\% \text{ (Boys)}$$
$$100\% - 90\% = 10\% \text{ Fail}$$
$$10\% = 45$$
$$100\% = x$$
$$x = \frac{45 \times 100}{10}$$
$$x = 450$$

In an examination, 80% of the boys passed in English and 85% passed in mathematics, while 75% passed in both. If 45 boys failed in both. The number of boys who sat for the examination was

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6. (a)

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LESSON #6 Based on Marks

$$65\% + 48\% - 30\% = 83\% \text{ Passed}$$
$$100\% - 83\% \text{ Passed} = 17\% \text{ Failed}$$

In an examination, 65% of the students passed in mathematics, 48% passed in physics and 30% passed in both. How much percent of students failed in both the subjects?

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LESSON #6 Based on Marks

$$100\% = 70\% + 80\% - x + 10\%$$

$$x = 160\% - 100\%$$

$$x = 60\%$$

$$\frac{60\%}{100\%} = \frac{24}{x}$$

$$100\% = x$$

$$x = 240$$

7. (a)

In an examination 70% of the candidates passed in English. 80% passed in Mathematics. 10% failed in both the subjects. If 144 candidates passed in both, the total number of candidates were:

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8. important to sum

PERCENTAGE

LESSON #6 Based on Marks

$$20\% \sim 30\% = 10\%$$

$$\leftarrow 5 \qquad \rightarrow = 25$$

$$\frac{50}{5} \qquad 10\% = 25 \qquad \text{Pass}\% = \frac{\text{Pass marks}}{\text{Total marks}} \times 100$$

$$\frac{55}{5} \qquad 100\% = x \qquad = \frac{55}{25} \times 100$$

$$\underline{\text{Pass}} \qquad x = 25 \times \frac{10}{5} \qquad = 220$$

$$\underline{\text{Total}}$$

(a)

In an examination, a student who gets 20% of the maximum marks fails by 5 marks. Another student who scores 30% of the maximum marks gets 20 marks more than the pass marks. The necessary percentage required for passing is:

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LESSON #6 Based on Marks

$$\frac{S_1}{100} + \frac{S_2}{100} + \frac{S_3}{100} = 390$$

$$60\% + 80\% + x = 70\%$$

↓

$$60 + 80 + x = 210$$

$$x = 210 - 80 - 60$$

$$\boxed{x = 70}$$

9. (a)

In an examination, there are three subjects of 100 marks each. A student scores 60% in the first subject and 80% in the second subject. He scored 70% in aggregate. His percentage of marks in the third subject is

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