GATE

ALL BRANCHES

GENERAL APTITUDE

Quantitative Aptitude

Lecture No: 11

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TOPICS TO BE COVERED

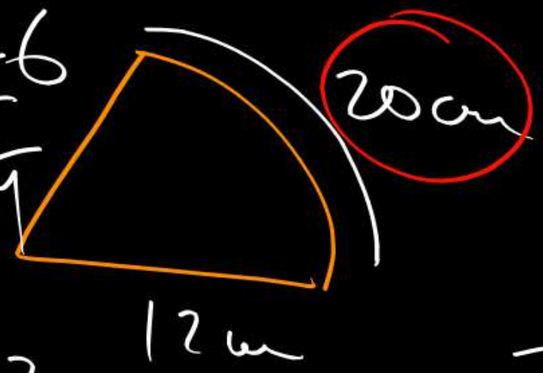
1. Understanding Interpretation
2. Various ways of Data Presentation
3. Questionnaire on the Topic

Q. What would be the area of sector of a circle whose radius is 12 cm and the length of the arc is 20 cm?

$$\text{Area} = \frac{\theta}{360} \times \pi r^2$$

$$= \frac{20}{24} \times 144$$

$$= 120\,cm^2$$



$$\frac{\theta}{360} \times 2\pi r = 20$$

$$\frac{\theta}{360} \times \pi = \frac{20}{2 \times 12} = \frac{20}{24}$$

Assignment

A. 60 sq. cm

B. 240 sq. cm

C. 120 sq. cm

D. 64 sq. cm

Q. The cross-section of a canal is a trapezium in shape. If the canal is 7 m wide at the top and 9 m at the bottom and the area of cross-section is 128 sq m, find the height of the canal.

Assignment

Area of trapezium

$128 = \frac{1}{2} \times (7+9) \times h$

$\frac{256}{16} = h$

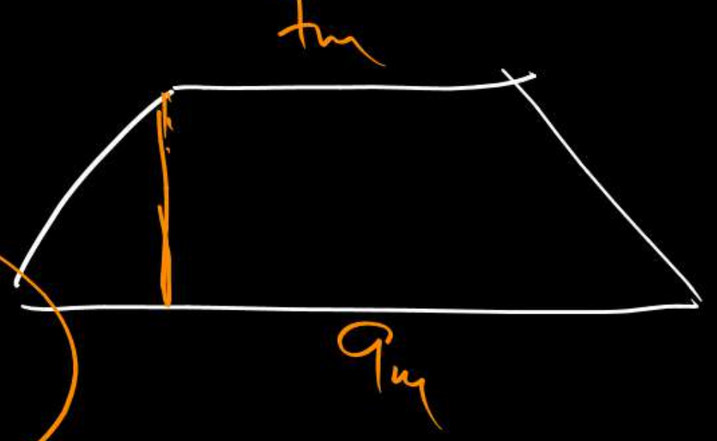
$\frac{16}{1}$

A. 32 m

B. 8 m

C. 4 m

D. 16 m



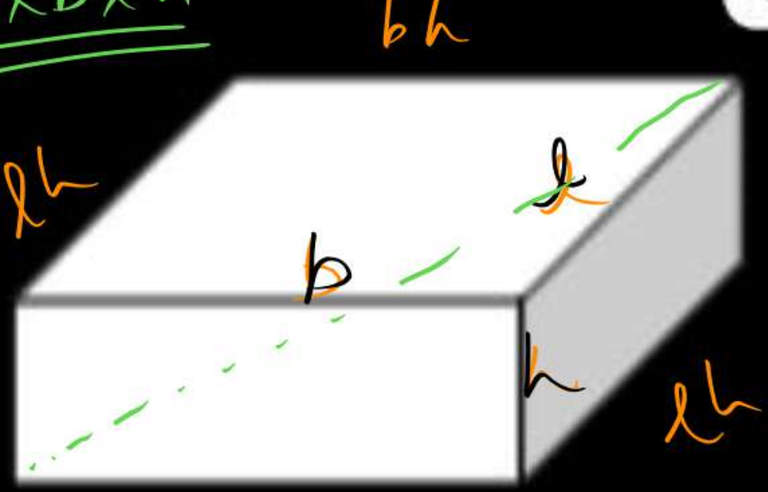
Mensuration 3D

Curved

1. Lateral Surface Area
2. Total Surface Area
3. Volume

Cuboid:

Volume $= l \times b \times h$



Lateral Surface Area

$= 2lh + 2bh$

$= 2h(l+b)$

Total Surface $= 2h(l+b) + 2lb$

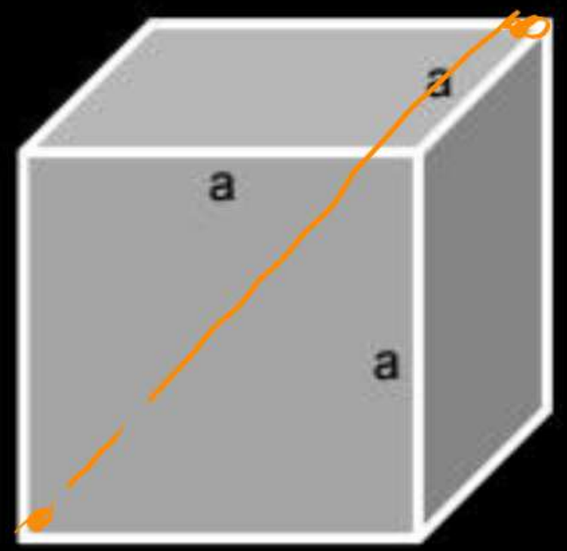
$= 2(lh+bh+lb)$

bh

longest diagonal

$= \sqrt{l^2+b^2+h^2}$

Cube:



Lateral Surface $= 4a^2$

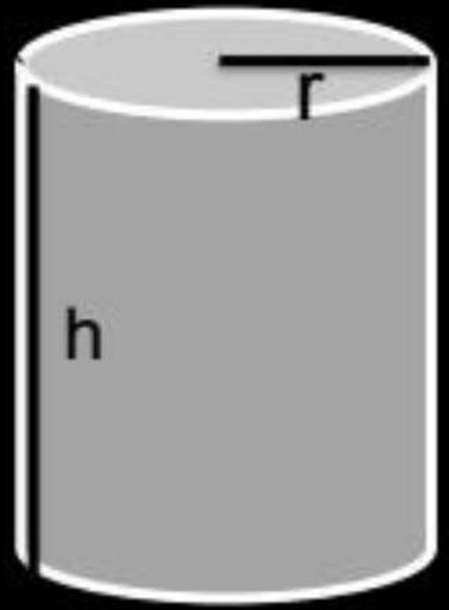
Total Surface $= 6a^2$

Volume $= a^3$

longest diagonal $= \sqrt{3}\,a$

Cylinder:

Volume $= \pi r^2 h$



Lateral Surface

$= 2\pi rh$

Total Surface Area

$= 2\pi rh + 2\pi r^2$

$= 2\pi r(h + r)$

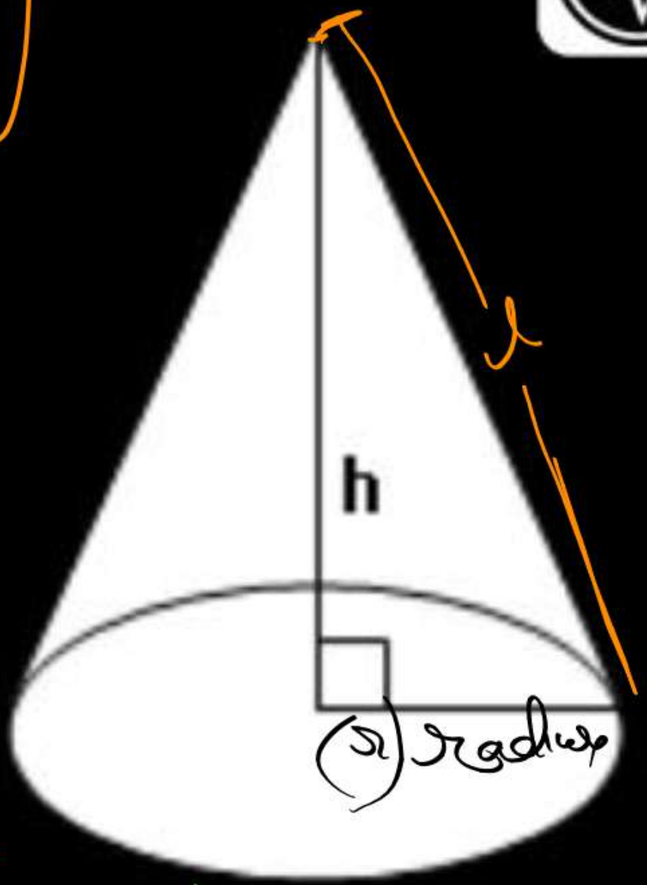
Cone:

$$l^2 = h^2 + r^2$$

Curved Lateral Surface Area $= \pi r l$

Total Surface Area $= \pi r l + \pi r^2$

$= \pi r (l + r)$

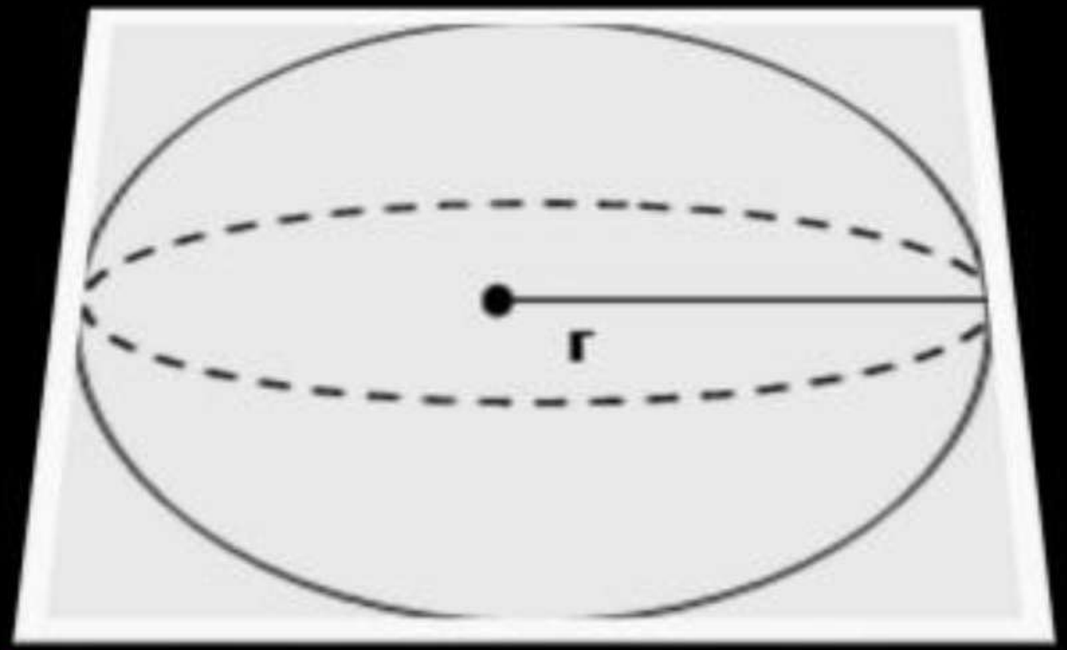


Volume $= \frac{1}{3} \pi r^2 h$

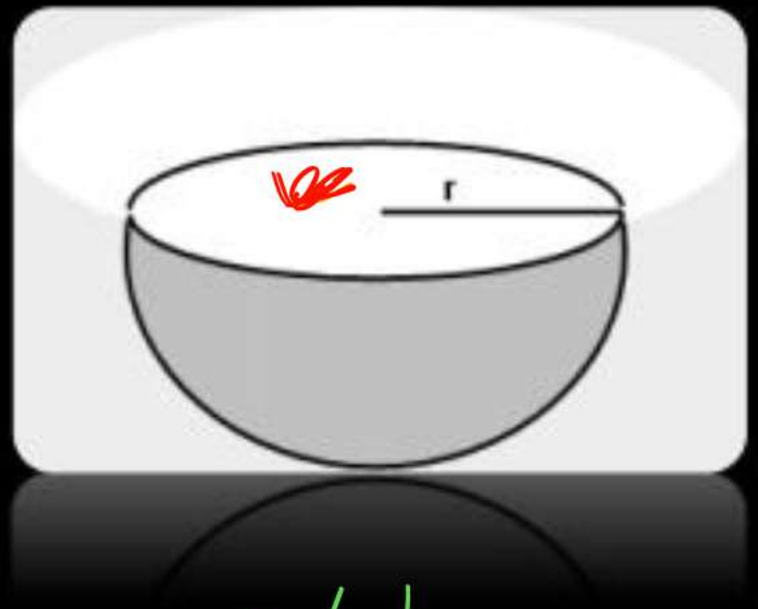
Sphere:

Surface Area $= 4\pi r^2$

Volume $= \frac{4}{3}\pi r^3$



Hemi-sphere:



Curved Surface Area $= 2\pi r^2$

Total Surface Area $= 2\pi r^2 + \pi r^2$

$= 3\pi r^2$

Volume $= \frac{1}{2} \times \frac{4}{3}\pi r^3$

$= \frac{2}{3}\pi r^3$

Q. A cube of 6 cm side melted and smaller cubes of 2 cm side are manufactured. Find the number of smaller cubes so formed.

A. 12

B. 27

C. 24

D. 8

Volume of One big cube

= Volume of 'x' small cubes

$216 = x \times 8$

$\frac{216}{8} = x$

$27 = x$

Q. The length, breadth & height of a cuboid are in the ratio of 4 : 3 : 2 and its volume is 3000 m3. Find its total surface area.

$4x \times 3x \times 2x = 3000$

$24x^3 = 3000$

$x^3 = \frac{3000}{24} = 125$

$x = \sqrt[3]{125} = 5$

A. 1300 m^2

B. 1500 m^2

C. 1333 m^2

D. 2700 m^2

$l = 20$

$b = 15$

$h = 10$

Total Surface Area

$= 2(lb + bh + hl)$

$= 2(300 + 150 + 200)$

$= 2 \times 650 = 1300\ m^2$

Q. The dimensions of a room are 20 m x 15 m x 10 m. What is the cost of painting its four walls at the rate of ₹15 per 100 sq m?

A. ₹70

B. ₹105

C. ₹225

D. None of these

l b h

lateral Surface Cuboid

$= 2(l+b)h$

$= 2(35) \times 10$

$= 700 m^2$

7×15

$= ₹105$

Q. In two concentric circles, a chord length 80 cm of larger circle becomes a tangent to the smaller circle whose radius is 9 cm. The radius of the larger circle will be?

A. 13 cm

B. 41 cm

C. 52 cm

D. 75 cm

Q. The diagonal of a rectangle is $\sqrt{41}$ cm and its area is 20 sq cm. The perimeter of the rectangle is?

A. 9 cm

B. 18 cm

C. 20 cm

D. 41 cm

Data Interpretation

Types:

The numerical data pertaining to any event can be presented by any one or more of the following methods.

1) Tables
2) Line Graphs
3) Bar Graphs or Bar Charts
4) Pie Charts or Circle Graphs

Tabular form:

Study the following table and answer the questions:

Source of Income	Employees				
	P	Q	R	S	T
Salary	400	200	700	300	400
Bonus	80	40	150	80	100
Overtime	180	70	200	170	200
Arrears	200	180	400	140	250
Misc	40	10	50	10	50
TOTAL	900	500	1500	700	1000

Q. Who among the following employees earns maximum bonus in comparison to his total income?

A. P

B. Q

C. R

D. S

Source of Income	Employees				
	P	Q	R	S	T
Salary	400	200	700	300	400
Bonus	80	40	150	80	100
Overtime	180	70	200	170	200
Arrears	200	180	400	140	250
Misc	40	10	50	10	50
TOTAL	900	500	1500	700	1000

Q. The income from overtime is what percent of income from arrears in the case of employee P?

A. 90

B. 80

C. 75

D. 40

$\frac{180}{200} \times 100$

90

Source of Income	Employees				
	P	Q	R	S	T
Salary	400	200	700	300	400
Bonus	80	40	150	80	100
Overtime	180	70	200	170	200
Arrears	200	180	400	140	250
Misc	40	10	50	10	50
TOTAL	900	500	1500	700	1000

Q. How many employee have their salary less than 3 times the income from bonus?

A. One

B. Two

C. Three

D. None

Source of Income	Employees				
	P	Q	R	S	T
Salary	400	200	700	300	400
Bonus	80	40	150	80	100
Overtime	180	70	200	170	200
Arrears	200	180	400	140	250
Misc	40	10	50	10	50
TOTAL	900	500	1500	700	1000

Q. Who among the following employees has maximum percentage of his salary out of the total income?

Source of Income	Employees				
	P	Q	R	S	T
Salary	400	200	700	300	400
Bonus	80	40	150	80	100
Overtime	180	70	200	170	200
Arrears	200	180	400	140	250
Misc	40	10	50	10	50
TOTAL	900	500	1500	700	1000

A. T ⇒ 40%

B. P ⇒ $\frac{400}{9} = 44.\overline{4}\%$

C. S ⇒ $\frac{300}{7} = 43\%$ (approx)

D. R ⇒ $\frac{700}{15} = 46.\overline{6}\%$

Q. Who among the following employees has minimum ratio of income from arrears to the income from salary?

Source of Income	Employees				
	P	Q	R	S	T
Salary	400	200	700	300	400
Bonus	80	40	150	80	100
Overtime	180	70	200	170	200
Arrears	200	180	400	140	250
Misc	40	10	50	10	50
TOTAL	900	500	1500	700	1000

A. P $\Rightarrow \frac{2}{4} = \frac{1}{2} = 0.5$

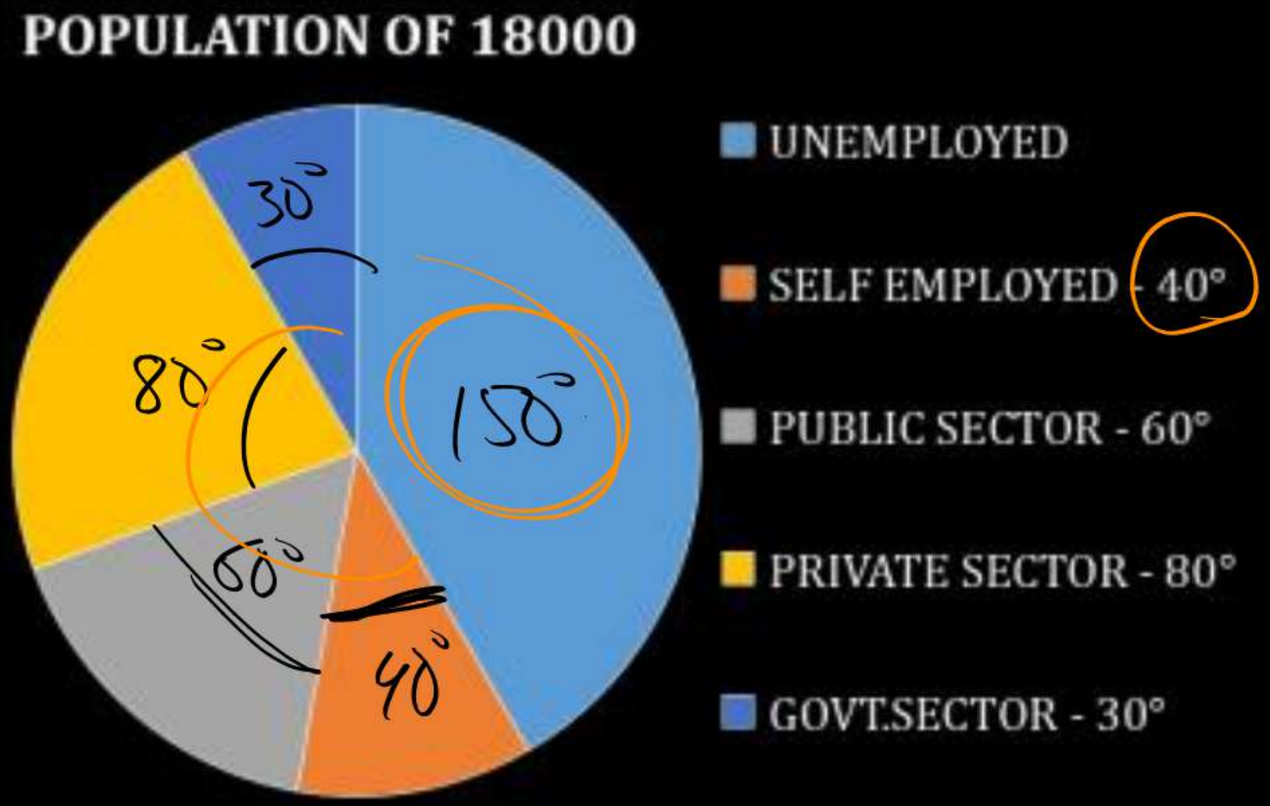
B. Q $\Rightarrow \frac{9}{10} = 0.9$

C. T $\Rightarrow \frac{5}{8} = 0.625$

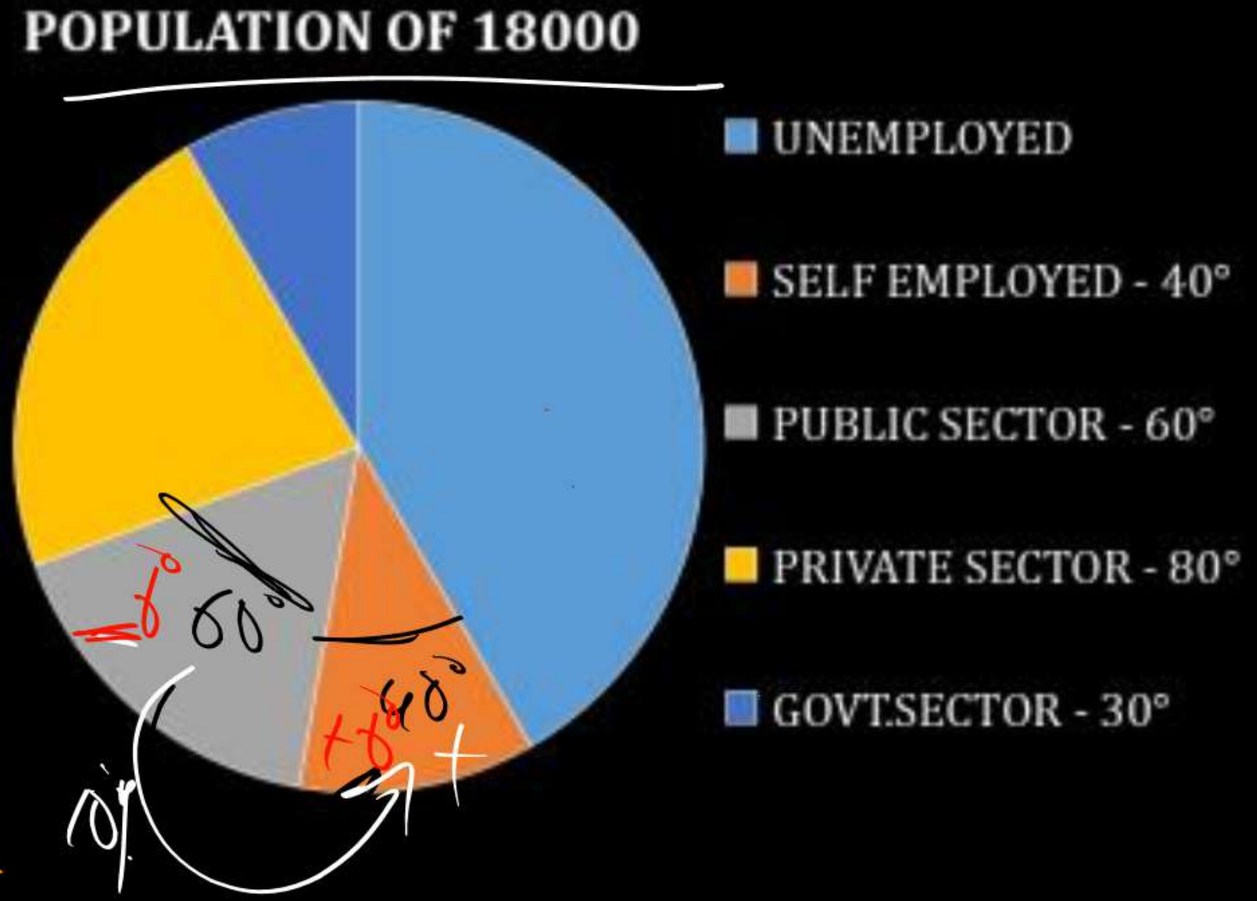
D. S $\Rightarrow \frac{7}{15} = 0.4\overline{6}$

Pie Chart:

Study the following graph carefully and answer the questions:



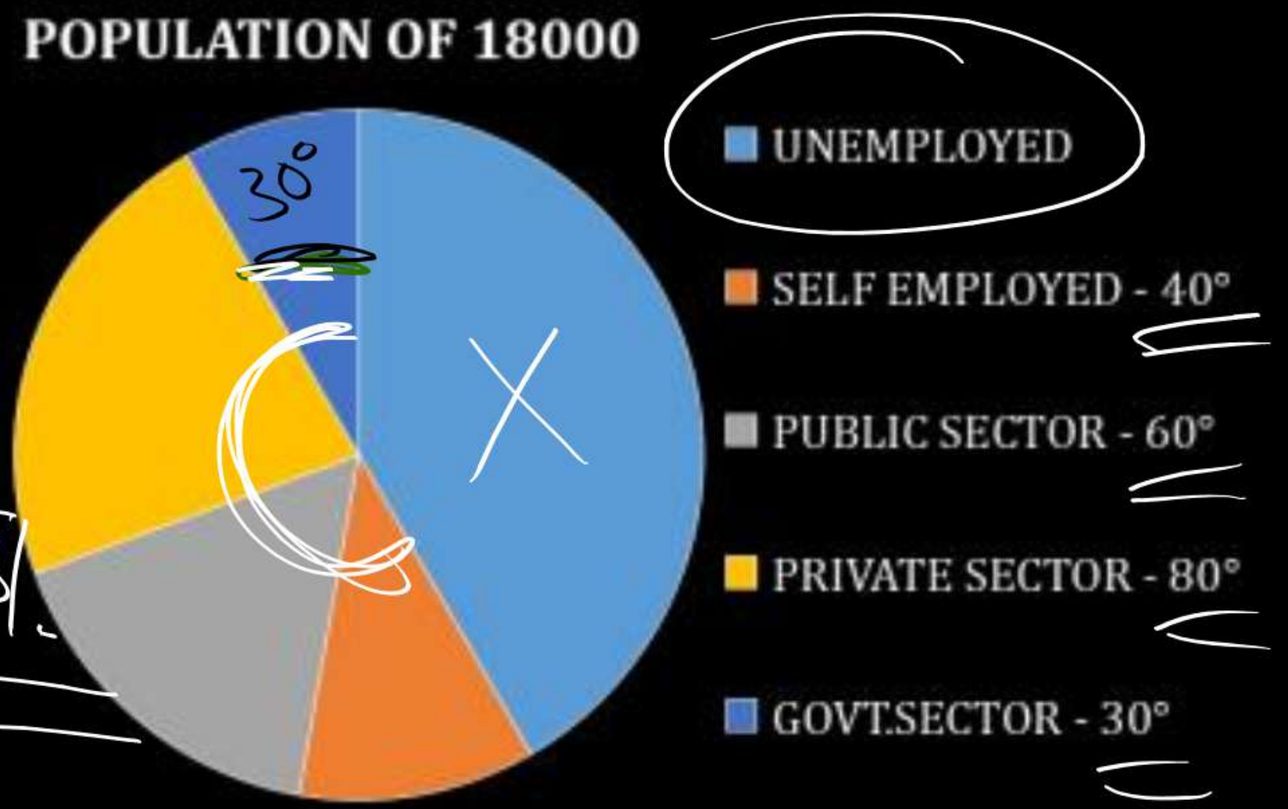
Q. If 10% of public sector people resign and becomes self-employed, find the increase percent in self-employed population.



Q. What percentage of employed people are working in government sector?

$$\frac{\frac{30^{\circ}}{210^{\circ}}}{7} \times 100$$

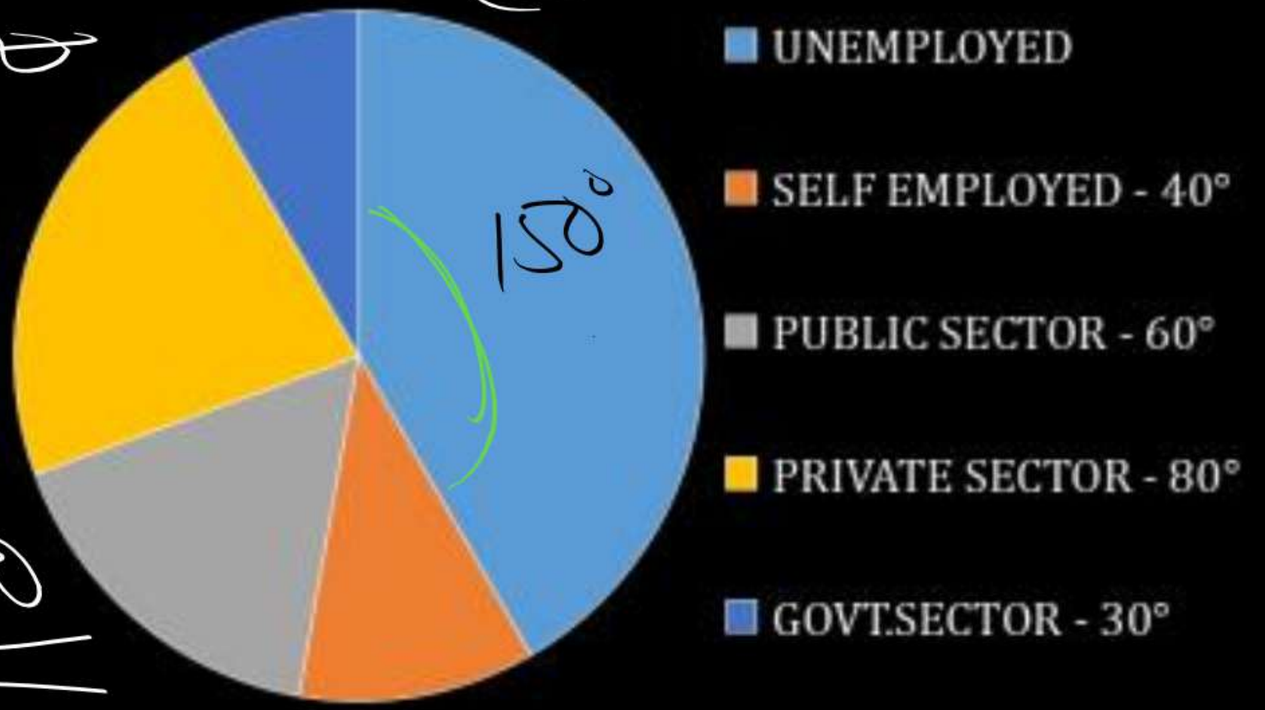
$$= \frac{100}{7} = 14.28\%$$



Q. Find the number of people who are unemployed.

$\frac{150}{360} \times 18000$

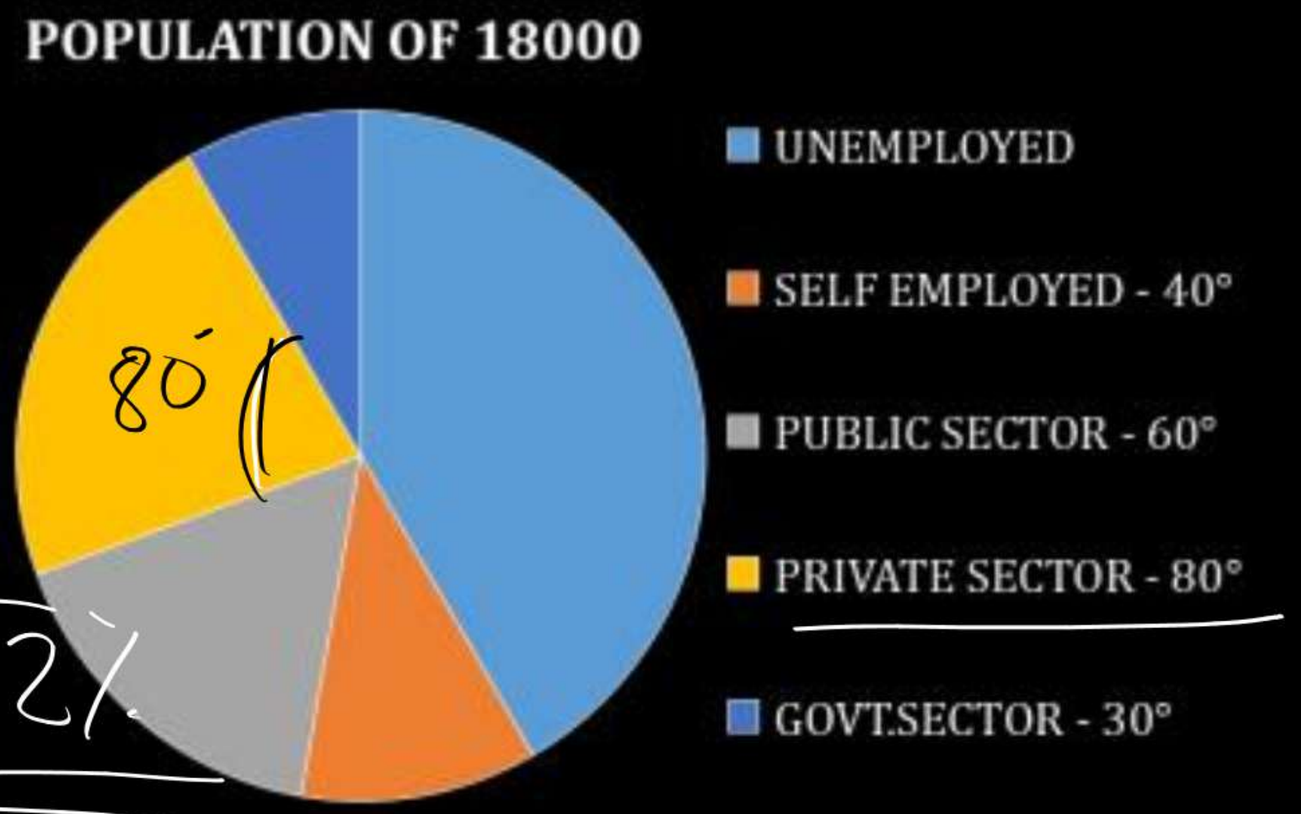
$= 7500$



Q. If private sector employees are to be mentioned in above chart in the form of percentage, it would be below .....%.

$\frac{80}{360} \times 100$

$= \frac{200}{9} = 22.2\%$



Line Graph:

Study the following graph carefully and answer the questions:

Marks scored by a student out of 500 in the Unit test held at different months of academic year 2019

Q. What is the pecentage of marks scored by the student in the unit test of August and October taken together?

A. 50%

B. 83.3%

C. 60%

D. 75.5%

Marks scored by a student out of 500 in the Unit test held at different months of academic year 2019

Q. What are the average of marks obtained by the student in the unit test of given academic year?

A. 361.6

B. 380.8

C. 377.5

D. 400.0

Marks scored by a student out of 500 in the Unit test held at different months of academic year 2019

Thank You !