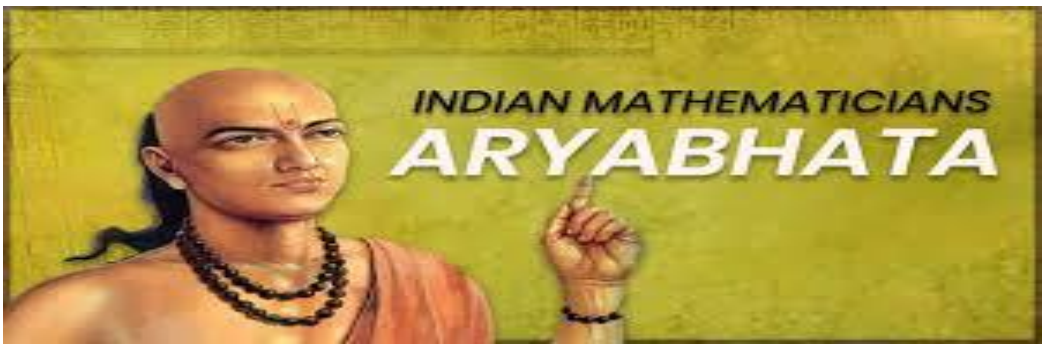
ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ಜಿಲ್ಲಾಡಳಿತ, ಜಿಲ್ಲಾ ಪಂಚಾಯತ ಧಾರವಾಡ,

ಉಪನಿರ್ದೇಶಕರ ಕಚೇರಿ, ಶಾಲಾ ಶಿಕ್ಷಣ ಇಲಾಖೆ, ಧಾರವಾಡ

ವಿಷಯ-ಗಣಿತ (ಇಂಗ್ಲೀಷ ಮಾಧ್ಯಮ)

ಎಸ್ ಎಸ್ ಎಲ್ ಸಿ ಪರೀಕ್ಷೆಯಲ್ಲಿ ಯಶಸ್ವಿಯಾಗಲು ವಿದ್ಯಾರ್ಥಿ ಸ್ನೇಹಿ ಅಧ್ಯಯನ ಸಂಪನ್ಮೂಲ



ಸಹಕಾರ

ಉಪ ನಿರ್ದೇಶಕರು (ಆಡಳಿತ) ಹಾಗೂ ಅಭಿವೃದ್ಧಿ

ಶಿಕ್ಷಣಾಧಿಕಾರಿಗಳು, ಜಿಲ್ಲಾ ಯೋಜನಾ ಉಪಸಮನ್ವಯಾಧಿಕಾರಿಗಳು , ಕ್ಷೇತ್ರ ಶಿಕ್ಷಣಾಧಿಕಾರಿಗಳು

ವಿಷಯ ಪರೀವಿಕ್ಷಕರು ಮತ್ತು ಜಿಲ್ಲಾ ಗಣಿತ ಪರಿವಾರ

ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ಜಿಲ್ಲಾಡಳಿತ, ಜಿಲ್ಲಾ ಪಂಚಾಯತ ಧಾರವಾಡ,

ಉಪನಿರ್ದೇಶಕರ ಕಚೇರಿ, ಶಾಲಾ ಶಿಕ್ಷಣ ಇಲಾಖೆ, ಧಾರವಾಡ

ಗಣಿತ ಪ್ರೇರಣಾ ದೀಪ್ತಿ

ಎಸ್.ಎಸ್.ಎಲ್. ಸಿ. ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಉತ್ಸಾಹ ಬುತ್ತಿ

ವಿಷಯ: ಗಣಿತ. (ಇಂಗ್ಲೀಷ ಮಾಧ್ಯಮ)

ಪರಿಕಲ್ಪನೆ: ಶ್ರೀಮತಿ ದಿವ್ಯಪ್ರಭು ಜಿ ಆರ್ ಜೆ ಮಾನ್ಯ ಜಿಲ್ಲಾ ಅಧಿಕಾರಿಗಳು ಧಾರವಾಡ

ಮಾರ್ಗದರ್ಶನ: ಶ್ರೀ ಎಸ್ ಎಸ್ ಕೆಳದಿಮಠ ಉಪನಿರ್ದೇಶಕರು (ಆಡಳಿತ) ಸಾ.ಶಿ.ಇ ಧಾರವಾಡ

ಸಲಹೆಗಾರರು:ಶ್ರೀ ವೈ ಬಿ ಬೊಮ್ಮಕನವರ ಕ್ಷೇತ್ರ ಶಿಕ್ಷಣಾಧಿಕಾರಿಗಳು ಹುಬ್ಬಳ್ಳಿ ಗ್ರಾಮೀಣ

ಶ್ರೀ ರಾಮಕೃಷ್ಣ ಆರ್ ಸದಲಗಿ ಕ್ಷೇತ್ರ ಶಿಕ್ಷಣಾಧಿಕಾರಿಗಳು ಧಾರವಾಡ ಗ್ರಾಮೀಣ

ಪ್ರೋತ್ಸಾಹ:ಶ್ರೀಮತಿ ಡಾ.ರೇಣುಕಾ ಅಮಲ್ಜರಿ ಸ ಯೋ ಸಂ ಅ ಶಾ ಶಿ ಇ ಧಾರವಾಡ

ಶ್ರೀ ಯಲ್ಲಪ್ಪ ಹುಬ್ಬಳ್ಳಿ ಗಣಿತ ವಿಷಯ ಪರೀವಿಕ್ಷಕರು ಶಾ ಶಿ ಇ ಧಾರವಾಡ

ಸಂಪನ್ಮೂಲ ರಚನಾ ತಂಡ

ಶ್ರೀ ಬಸವರಾಜ ಚಿಕ್ಕನರಗುಂದ ಸರ್ಕಾರಿ ಪ್ರೌಢಶಾಲೆ,ಯಲಿವಾಳ ತಾ: ಕುಂದಗೋಳ

ಶ್ರೀಮತಿ ರೇಣುಕಾ ಪಾಟೀಲ್ ಸರ್ಕಾರಿ ಪ್ರೌಢಶಾಲೆ ದೇವರಹುಬ್ಬಳ್ಳಿ ತಾ:ಧಾರವಾಡ

ಶ್ರೀಮತಿ ಚಂದ್ರಿಕಾ ಗಲಗಲಿ ಸರ್ಕಾರಿ ಪ್ರೌಢಶಾಲೆ,ಕುರುಬಗಟ್ಟಿ ತಾ :ಧಾರವಾಡ

ಶ್ರೀ ಎಸ್ ಎಂ ಮನಿಯಾರ ಡಾ.ಬಿ ಆರ್ ಅಂಬೇಡ್ಕರ್ ವಸತಿ ಶಾಲೆ,ಛಬ್ಬಿ ತಾ:ಹುಬ್ಬಳ್ಳಿ

ಶ್ರೀ ಶಿವಶಂಕರ ಚಿಕ್ಕನರಗುಂದ ಅಟಲ್ ಬಿಹಾರಿ ವಾಜಪೇಯಿ ವಸತಿ ಶಾಲೆ,ಧಾರವಾಡ

ಕರ್ನಾಟಕ ಸರಕಾರ

ಜಿಲ್ಲಾಡಳಿತ ಧಾರವಾಡ

ಶ್ರೀಮತಿ ದಿವ್ಯಪ್ರಭು ಜಿ.ಆರ್.ಜೆ. ಭಾ.ಆ.ಸೇ

ಆಶಯ ನುಡಿ–

ಪ್ರಿಯ ವಿದ್ಯಾರ್ಥಿಗಳೇ,

ಈ ಸಂದೇಶವು ನಿಮ್ಮಲ್ಲಿ ಶ್ರದ್ಧೆಯಿಂದ ಓದುವ ಮತ್ತು ಆತ್ಮವಿಶ್ವಾಸದಿಂದ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ ಪರೀಕ್ಷೆಯನ್ನು ಎದುರಿಸಿ ಉತ್ತಮ ಫಲಿತಾಂಶವನ್ನು ಪಡೆಯುವ ಶಕ್ತಿಯನ್ನು ತುಂಬುತ್ತದೆ ಎಂದು ನಾನು ಭಾವಿಸುತ್ತೇನೆ.

ಧಾರವಾಡ ಜಿಲ್ಲೆಯ ಶಿಕ್ಷಣ ತಜ್ಞರೆಲ್ಲ ಸೇರಿಕೊಂಡು, ''ಮಿಷನ್ ವಿದ್ಯಾಕಾಶಿ'' ಎಂಬ ಪರೀಕ್ಷಾ ಫಲಿತಾಂಶ ಸುಧಾರಣಾ ಯಶಸ್ಸಿನ ಓಟಕ್ಕೆ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ವಿದ್ಯಾರ್ಥಿಗಳಾದ ತಮ್ಮನ್ನೆಲ್ಲ ಸಿದ್ಧಗೊಳಿಸಲು ಸನ್ನದ್ಧರಾಗಿದ್ದಾರೆ. ನಿಮ್ಮಲ್ಲಿ ಪ್ರತಿಯೊಬ್ಬರೂ ಪ್ರತಿಭೆ, ಸಾಮರ್ಥ್ಯ ಮತ್ತು ಕನಸುಗಳನ್ನು ಹೊಂದಿದ್ದೀರಿ, ಅದು ಸಾಕಾರಗೊಳ್ಳಲು ಕಾಯುತ್ತಿದೆ. ನಿಮ್ಮ ಉತ್ತಮ ಭವಿಷ್ಯಕ್ಕೆ ಮತ್ತು ಮಹೋನ್ನತ ಗುರಿಯ ಸಾಧನೆಗೆ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪರೀಕ್ಷೆಯು ಮಹತ್ವದ ಘಟ್ಟವಾಗಿದೆ. ಈ ಪರೀಕ್ಷೆಯಲ್ಲಿ ಉತ್ತಮ ಅಂಕ ಗಳಿಸಲು ನಿರಂತರ ಅಧ್ಯಯನದ ಅವಶ್ಯಕತೆ ಇದೆ. ಹಾಗಾದರೆ ದಿನನಿತ್ಯದ ನಮ್ಮ ಅಧ್ಯಯನ ಹೇಗಿರಬೇಕು? ಎಂಬ ಪ್ರಶ್ನೆಯು ಪ್ರತಿಯೊಬ್ಬರನ್ನೂ ಕಾಡಿರುತ್ತದೆ. ಈ ಕುರಿತಂತೆ ಮಹಾತ್ಮಾ ಗಾಂಧೀಜಿಯವರು 'ನಾವು ಏನನ್ನು ಓದುತ್ತೇವೆಯೋ ಅದರ ಬಗ್ಗೆ ಚಿಂತಿಸಬೇಕು, ಅದನ್ನು ಜೀರ್ಣೀಸಿಕೊಳ್ಳಬೇಕು ಹಾಗೂ ಅದು ನಮ್ಮ ದಿನನಿತ್ಯ ಜೀವನದ ಒಂದು ಅವಿಭಾಜ್ಯ ಅಂಗವಾಗಿರಬೇಕು' ಎಂದು ಹೇಳಿದ್ದನ್ನು ಮೆಲುಕು ಹಾಕುತ್ತಾ ಪ್ರತಿ ದಿನ ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ತಿಳಿಸುವ ವಿಷಯಗಳನ್ನು ಸರಿಯಾಗಿ ಮನನ ಮಾಡಿಕೊಂಡು ಪುನಃ ಪುನಃ ದೃಢೀಕರಿಸಿಕೊಳ್ಳಲು ಪ್ರಾಮಾಣಿಕ ಪ್ರಯತ್ನ ಮಾಡಬೇಕು.

ಪ್ರಸ್ತುತ ಶೈಕ್ಷಣಿಕ ವರ್ಷದಲ್ಲಿ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪರೀಕ್ಷೆಗೆ ಹಾಜರಾಗುತ್ತಿರುವ ಎಲ್ಲ ವಿದ್ಯಾರ್ಥಿಗಳೂ ಪರೀಕ್ಷೆಯಲ್ಲಿ ಉತ್ತಮ ಅಂಕ ಗಳಿಸಲು ಸರಳವಾಗಿ ಮತ್ತು ಸುಲಭವಾಗಿ ತಿಳಿಯುವಂತೆ ಪೂರಕ ಸಾಹಿತ್ಯವನ್ನು ಸಂಪನ್ಮೂಲ ಶಿಕ್ಷಕರ ಸಹಕಾರದೊಂದಿಗೆ ಸಿದ್ಧಪಡಿಸಲಾಗಿರುತ್ತದೆ. ವಿದ್ಯಾರ್ಥಿಗಳು ಈ ಕಲಿಕಾ ಸಂಪನ್ಮೂಲವನ್ನು ಸದುಪಯೋಗಪಡಿಸಿಕೊಂಡು ಉತ್ತಮವಾದ ಫಲಿತಾಂಶವನ್ನು ಪಡೆಯಲಿ ಮತ್ತು ರಾಜ್ಯದಲ್ಲಿ ಧಾರವಾಡ ಜಿಲ್ಲೆಯ ಪ್ರತಿಶತ ಫಲಿತಾಂಶವೂ ಕೂಡ ಹೆಚ್ಚಾಗಲಿ ಎಂದು ಶುಭ ಹಾರೈಸುತ್ತೇನೆ.

ಶ್ರೀಮತಿ ದಿವ್ಯಪ್ರಭು ಜಿ.ಆರ್.ಜೆ. ಭಾ.ಆ.ಸೇ

ಜಿಲ್ಲಾಧಿಕಾರಿಗಳು ಹಾಗೂ ಜಿಲ್ಲಾ ದಂಡಾಧಿಕಾರಿಗಳು,

ಧಾರವಾಡ ಜಿಲ್ಲೆ, ಧಾರವಾಡ.

ಕರ್ನಾಟಕ ಸರಕಾರ

ಜಿಲ್ಲಾಡಳಿತ, ಜಿಲ್ಲಾ ಪಂಚಾಯತ್ ಹಾಗೂ ಶಾಲಾ ಶಿಕ್ಷಣ ಇಲಾಖೆ ಧಾರವಾಡ

ಎಸ್.ಎಸ್.ಕೆಳದಿಮಠ

ಮುನ್ನುಡಿ

ಪ್ರತಿಯೊಂದು ಮಗು ಗುಣಾತ್ಮಕ ಶಿಕ್ಷಣವನ್ನು ಪಡೆದು ಭವಿಷ್ಯವನ್ನು ಉತ್ತಮವಾಗಿ ಕಟ್ಟಿಕೊಳ್ಳಲು ಶಾಲಾ ಶಿಕ್ಷಣ ಇಲಾಖೆಯು ಹಲವಾರು ಪ್ರಯತ್ನಗಳನ್ನು ಮಾಡುತ್ತಲೇ ಇರುತ್ತದೆ. ಪ್ರತಿಯೊಂದು ಮಗು ವೈಯಕ್ತಿಕ ಭಿನ್ನತೆಯನ್ನು ಹೊಂದಿದ್ದು ಅದಕ್ಕೆ ಅನುಗುಣವಾಗಿ ಶಿಕ್ಷಕರು ವಿವಿಧ ಕಲಿಕಾ ಬೋಧನಾ ವಿಧಾನಗಳನ್ನು ಅನುಸರಿಸಿ ಉತ್ತಮ ಕಲಿಕೆಗಾಗಿ ಶ್ರಮಿಸುತ್ತಾರೆ. ವಿದ್ಯಾರ್ಥಿಗಳ ಕಲಿಕಾ ಗುಣಮಟ್ಟವನ್ನು ಪರೀಕ್ಷೆಗಳ ಮೂಲಕ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುತ್ತದೆ..

ವಿದ್ಯಾರ್ಥಿ ಜೀವನದಲ್ಲಿ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪರೀಕ್ಷೆಯು ಒಂದು ಮಹತ್ವದ ಮೈಲುಗಲ್ಲಾಗಿದೆ. ಪ್ರತಿಯೊಬ್ಬ ವಿದ್ಯಾರ್ಥಿಯು ಇದರಲ್ಲಿ ಯಶಸ್ಸನ್ನು ಪಡೆಯುವುದು ಅನಿವಾರ್ಯವಾಗಿದೆ. ಈ ಹಿನ್ನಲೆಯಲ್ಲಿ ಎಲ್ಲ ವಿದ್ಯಾರ್ಥಿಗಳು ಉತ್ತಮ ಅಂಕಗಳನ್ನು ಪಡೆಯುವ ಮೂಲಕ ಉತ್ತೀರ್ಣರಾಗಿ ಮುಂದಿನ ಶಿಕ್ಷಣಕ್ಕೆ ಅರ್ಹತೆ ಸಾಧಿಸಬೇಕು ಎಂಬ ಉದ್ದೇಶದಿಂದ ಎಲ್ಲ ವಿಷಯಗಳಲ್ಲಿ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವಂತೆ ಪೂರಕ ಸಾಹಿತ್ಯವಾಗಿ ಕಿರುಹೊತ್ತಿಗೆಯನ್ನು ಸಂಪನ್ಮೂಲ ಶಿಕ್ಷಕರು ಸಿದ್ಧಪಡಿಸಿರುತ್ತಾರೆ. ಇವು ಮುಂಬರುವ ಪರೀಕ್ಷೆಯನ್ನು ಎದುರಿಸಲು ಹೆಚ್ಚು ಸಹಕಾರಿಯಾಗುತ್ತವೆ ಎಂಬ ವಿಶ್ವಾಸವಿದೆ. ವಿದ್ಯಾರ್ಥಿಗಳ ವೈಯಕ್ತಿಕ ಭಿನ್ನತೆಯ ಕಲಿಕೆಯ ವೇಗಗಳ ಹಿನ್ನಲೆಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಈ ಪೂರಕ ಸಾಹಿತ್ಯವನ್ನು ಮಾದರಿಯಾಗಿಸಿಕೊಂಡು ಉತ್ತಮ ಫಲಿತಾಂಶವನ್ನು ಪಡೆಯಲು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಮಾರ್ಗದರ್ಶನ ಮಾಡಲಿ ಹಾಗೂ ವಿದ್ಯಾರ್ಥಿಗಳು ಈ ಕಲಿಕಾ ಸಂಪನ್ಮೂಲವನ್ನು ಸದುಪಯೋಗಪಡಿಸಿಕೊಂಡು ಪರೀಕ್ಷೆಯನ್ನು ಆತ್ಮವಿಶ್ವಾಸದಿಂದ ಎದುರಿಸಿ ಯಶಸ್ಸನ್ನು ಗಳಿಸಲಿ ಎಂದು ಹಾರೈಸುತ್ತೇನೆ.

ಎಸ್.ಎಸ್.ಕೆಳದಿಮಠ

ಉಪನಿರ್ದೇಶಕರು(ಆಡಳಿತ) ಶಾಲಾ ಶಿಕ್ಷಣ ಇಲಾಖೆ ಧಾರವಾಡ

Sl.no	Chapter Name	Learning Points	Marks
1	Real Numbers	Accomplish being irrational Product of Prime Factors Or HCF MCM	2+2 / 3+1
2	Polynomials	Polynomial exponent/structure The emptiness of polytheism is found and the relation is drawn	2+2 / 3+1
3	Simultaneous equation in Two variables	Comparing a b c	7
		Graph	
		Cancelation method	
4	Quadratic Equation	Analyzing the nature of roots A quadratic equation is the product of the sum of the roots	2+2 / 3+1
5	Athematic Progression	Formulas, a, d, n, an Problems	1+2
6	Co-ordinates Geometry	Finding Distance between pints Section formula	2+2 / 3+1
7	Introduction to trigonometry	Trigonometric Ratios	1+2
8	Triangles	Theorems	4/5
9	Circles	Theorems	3
10	Area related to circles	Formulae and small Problems	1+1
11	Probability	Small problems	
12	Statistics	Mean Mode median	6
13	Mensuration	Formulae and small Problems	1+1

	Real Number
Class:10	Marks :02
Learning Point	Prove the irrational numbers

Solved Examples

1) Prove that $2+\sqrt{5}$ is irrational number

Solutions :- let us assume $2+\sqrt{5}$ is a rational number

$2+\sqrt{5} = \frac{p}{q}$ where p, q∈ z, q≠0

$\sqrt{5} = \frac{p}{q} - 2$

$\sqrt{5} = \frac{p-2q}{q}$

p & q whole numbers

So $\frac{p-2q}{q}$ is rational number

But $\sqrt{5}$ is not a rational numbers our assumption is wrong

So $2+\sqrt{5}$ is irrational number

2) Prove that $5+3\sqrt{2}$ is a irrational number

Solutions :-$5+3\sqrt{2}$ rational number

$5+3\sqrt{2} = \frac{p}{q}$ where p, q∈ z, q≠0

$\sqrt{2} = \frac{p}{q} - 5$

$\sqrt{2} = \frac{p-5q}{3q}$

p & q whole numbers

So $\frac{p-5q}{3q}$ is rational number

but $\sqrt{2}$ is not a rational numbers

our assumption is wrong $5+3\sqrt{2}$ is not rational number

$5+3\sqrt{2}$ is irrational number

Try yourself

1	Prove that $5+\sqrt{3}$ is a irrational number JUNE 2019
2	Prove that $3+\sqrt{5}$is a irrational number MARCH 2019
3	Prove that $\sqrt{2}+\sqrt{5}$ is a irrational number
4	Prove that $\sqrt{3}+\sqrt{2}$ is a irrational number
5	Prove that $3+2\sqrt{5}$ is a irrational number
6	Prove that $5+3\sqrt{2}$ is a irrational number
7	Prove that $5+3\sqrt{2}$ is a irrational number
8	Prove that $\sqrt{3}$ is a irrational number 2020
9	Prove that $6+4\sqrt{2}$ is a irrational number
10	Prove that $\sqrt{5}$ is a irrational number 2020

Chapter Real Numbers

Class: 10	Mark -02
Learning point	Prime factorization of given number

Solved example

Express 72 as a product of prime factors 72

Solutions:

2	72
2	36
2	18
3	9
3	3
	1

$$72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$$

LCM of (24 36) is 48 then, Find the HCF (24 36).

Solutions:

A= 24 , B= 36

A x B = H x L

24 x 36 = H x 48

$\therefore H = \frac{24\ x\ 36}{48} = 18$

H=18

	"Try your self "	Answers
1	Express 96 as a products of prime factors -June 2019	$2^5 \times 3$
2	Express 120 as a products of prime factors - Model 2019	$2^3 \times 3 \times 5$
3	Express 150 as a products of prime factors	$2^2 \times 3 \times 13$
4	Find the HCF and LCM by prime factorization method (510, 92)	23460
5	Express 140 as a products of prime factors Model 2019	$2^2 \times 5 \times 7$
6	Find the HCF and LCM of (26 & 91) and Verify it	$2366 = 2366$
7	HCF of (306 657) is 12 .Find the LCM Sept 2020	22338
8	Find the HCF of (135, 225) using division lemma	45
9	Find the LCM and HCF 12, 15 & 21 by prime factorization method	420

Polynomials	
Class: 10	Marks -02
Learning points	Find the Zero of polynomials

Solved Examples

1) Find the zero's of polynomial $P(x) = x^2 + 2x - 15$

Ans: $x^2 + 2x - 15 = 0$

$x^2 + 5x - 3x - 15 = 0$

$x(x + 5) - 3(x + 5) = 0$

$(x + 5)(x - 3) = 0$

$x + 5 = 0 \quad x - 3 = 0$

$x = -5$ or $x = 3$

$\therefore x = -5 \ and \ x = 3.$

	Try your self	Answers
1	Write the degree of polynamial $P(x) = x^3 + 2x^2 - 5x - 6$ June 2019	3
2	Write the degree of polynamial $P(x) = 2x^2 - x^3 + 5$	3
3	Find the Zero'sof polynamils $P(x) = x^2 - 3$	$x = \sqrt{3}, x = -\sqrt{3}$
4	Find the Zero'sof polynamils $P(x) = x^2 - 2x - 8$	$x = 4 \ or \ -2$
5	Find the Zero'sof polynamils $P(x) = x^2 - 7x + 12$	$x = 4 \ or \ 3$
6	If one of zero's of polynamial $P(x) = x^2 - 6x +$ k is twice the another then find the value of k [Apl-2020]	$k = 8$

Quadratic Equations	
Class-10	Marks:-02
Learning Point	Find the discriminant value and Nature of roots of quadratic equations
	Discriminant =$\Delta = b^2 - 4ac$ Standard form of quadratic equation $ax^2 + bx + c = 0$

Discriminant	Nature of roots
$b^2 - 4ac = 0$	Real and equal
$b^2 - 4ac > 0$	Real and Distinct
$b^2 - 4ac < 0$	No real roots

Solved Examples

1) The discriminant and nature of the roots of the quadratic equation $2x^2 - 5x + 3 = 0$

	Try these	Ans
1	$2x^2 - 4x + 3 = 0$ MAR2019	Δ=-8, $\Delta <$ No real roots
2	$3x^2 - 5x + 2 = 0$ model 2020	Δ=1, $\Delta > 0$ roots are Real and Distinct
3	$4x^2 - 12x + 9 = 0$	Δ=0, $\Delta = 0$ roots are Real and equal
4	$4x^2 - 4x + 1 = 0$	Δ=0, $\Delta = 0$ roots are Real and equal
5	$2x^2 - 5x + 4 = 0$	Δ=-7, $\Delta < 0$ No real roots
6	$2x^2 - 3x + 5 = 0$	Δ=-31, $\Delta < 0$ No real roots
7	$x^2 + 4x + 4 = 0$	Δ=0, $\Delta = 0$ roots are Real and equal
8	$2x^2 - 6x + 3 = 0$	Δ=12 $\Delta > 0$ roots are Real and Distinct
9	$2x^2 - x + 3 = 0$	Δ=-23 $\Delta < 0$ No real roots

Arithmetic progression	
Class : 10	Marks-01
Leaning Points	n^{th} term of AP and common difference
	$d=a_2-a_1$

Solved Examples

1. **The nth term of an Arithmetic Progression is a_n=4n+ 5. Find its 5th term.**

Solution;- a_n=4 n +5

a_5=4 (5) +5

a_5=20 +5

a_5=25

2. In an a**rithmetic Progression** n^{th} term is a_n=7-4n. Then find common difference.

Solution;-

a_n=7-4 n

$a_1 = 7 - 4\ (1)$

a_1=7-4

a_1=3

a_n=7-4 n

$a_2 = 7 - 4\ (2)$

a_2=7-8

a_2=-1

$d=a_2-a_1$

d=-1-3

$d=-4$

Try your self

1	If In an arithmetic Progression n^{th} term is a_n=24-3 n Then find a_2 March 2019
2	If In an arithmetic Progression n^{th} term is a_n=5 n +3 Then find 3^{rd} term June 2019
3	If In an arithmetic Progression n^{th} term is a_n=4 n^2 -1 Then find 8^{th} term Model 2019
4	If In an arithmetic Progression n^{th} term is a_n=3 n -2 Then find 9^{th} term
5	If In an arithmetic Progression n^{th} term is a_n=$2n^2$-2 Then find 3^{rd} term
6	If In an arithmetic Progression n^{th} term is a_n=3 n^2 + n Then find 3^{rd} term
7	If In an arithmetic Progression n^{th} term is a_n=2 n +1 then find common difference April 2020
8	If In an arithmetic Progression n^{th} term is a_n=4 n - 5 Then find 5^{th} term
9	If In an arithmetic Progression n^{th} term is a_n=5n-8 Then find 5^{th} term
10	If In an arithmetic Progression n^{th} term is a_n=3n +5 Then find 5^{th} term

	Arithmetic progression
Class -10	Marks:-02
Learning points	Find the n^{th} term of AP
Formula to be use	$a_n = a + (n-1)d$
Points to be remember	When values of terms AP are in decreasing order then common difference be -ve . When values of terms AP are in increasing order then common difference be +ve.
Solved Examples	
1. 5,8,11 are in AP then find a_{30} Apl 2022	-3, -1, .1,3 are in AP then find 11^{th} term July 2021
Sol;- $a = 5, d = 8 - 5 = 3,$ $n = 30$ $a_n = ?$ $a_n = a + (n-1)d$ $a_{30} = 5 + (30-1)3$ $a_{30} = 5 + 29(3)$ $a_{30} = 5 + 87$ $a_{30} = 92$	Sol- $a = -3,\ d = -1 - (-3) = 2,\ n = 11$ $a_n = ?$ $a_n = a + (n-1)d$ $a_{11} = -3 + (11-1)2$ $a_{11} = -3 + 10(2)$ $a_{11} = -3 + 20$ $a_{11} = 17$

	Try your selves	Ans
1	2,5,8 ,------ Are the terms of AP.Find the 12^{th} term of AP (july-2023)	35
2	3,6,9--- Are the terms of AP.Find the 15^{th} term of AP (july 2022)	45
3	6,10,14---- Are the terms of AP.Find the 18^{th} term of AP (March 2022)	74
4	1,5,9,13---- Are the terms of AP.Find the 20^{th} term of AP (july 2021)	77
5	2,7,12.------ Are the terms of AP.Find the 10^{th} term of AP	47
6	21. 18, 15---- Are the terms of AP.Find the 10^{th} term of AP	-6
7	10,7,4--- Are the terms of AP.Find the 11^{th} term of AP	-20
8	5.9,13---- Are the terms of AP.Find the 10^{th} term of AP.	41
9	2,6,10,14---- Are the terms of AP.Find the 25^{th} term of AP	98
10	3,10,17,24--- Are the terms of AP.Find the 6^{th} term of AP	38

Arithmetic Progression	
Calss :-10	Marks:-02
Learning points	To find sum of n^{th} terms
Formula to be use :	$S_n = \frac{n}{2}[2a + (n-1)d]$
Points to be remember	First term is "a_1' common difference is $d = a_2 - a_1$
Model Problems	
1. 10,15,20 …. Are the terms of AP then find sum of 20 terms Apl 2022	If n^{th} term is 28 and $S_9 = 144$. Then find first term
Sol;-$a = 10,\ d = 15 - 10 = 5,\ n = 20\quad S_n = ?$ $S_n = \frac{n}{2}[2a + (n-1)d]$ $S_{20} = \frac{20}{2}[2(10) + (20-1)5]$ $= 10(20 + 19(5)$ $= 10(20 + 95)$ $= 10(115)$ $S_{20} = 1150$	Sol;- $a = ?,\ \ell = 28\ \ n = 9\quad S_n = 144$ $S_n = \frac{n}{2}[a + \ell]$ $144 = \frac{9}{2}[a + 28]$ $288 = 9[a + 28]$ $288 = 9a + 252$ $9a = 288 - 252 = 36$ $9a = 36\quad a = \frac{36}{9} = 4\quad a = 4$

	Try your selves	Answers
1	7,11,15. . .are the terms of AP then Find Sum of first 16 terms (July2022)	35
2	3,6,9--- are the terms of AP $S_n = 165$. Find the number of terms (July 2022)	45
3	2+7+12---- are the terms of AP then Find Sum of first 20 terms April 2019	74
4	5,+8,+11+---- are the terms of AP then Find Sum of first 10 terms (July2020)	77
5	5,+10+,15. . .are the terms of AP then Find Sum of first 20 terms Sept 2020	47
6	2+5+8---- are the terms of AP then Find Sum of first 30 terms	-6
7	, $d = 2\ \ \ell = 4,\ S_n = -14\ a = ?,\quad n = ?$	-20
8	$\ell = 62$, $a = 8,\quad S_n = 210\quad n = ?\quad d = ?$	41

Arithmetic Progression	
Class:-10	Marks:-02
Learning Point	Find the Sum of n^{th} terms
Formula	$S_n = \frac{n}{2}[(n+1)]$
Points Remember	Sum of Even numbers $=S_n=n(n+1)$ Sum of odd numbers $=S_n=n^2$
Model Problems	
1. Find the sum of first 20 positive whole numbers April 2022	2. Find the sum of first 40 numbers which are divisible by 6
Solution ;- $S_n = 1+2+3+4+-$ $S_n = \sum n = \frac{n(n+1)}{2}$ $S_n == \frac{20(20+1)}{2}$ $S_n == \frac{10(21)}{1}$=210	Solution;- S_n =6+12+18+24+----40£É S_n =6(1+2+3+4+---40 $S_n = \sum n = \frac{n(n+1)}{2}$ $S_n = 6\ (\frac{40(40+1)}{2})$ $= 6\ \ (20*41) = 6\ \ (820) = 4920$

Try yours self	
1	Find the sum of first 50 odd number by using Arithmetic Progressionformuala
2	Find the sum of first 10 even number by using Arithmetic Progression formuala
3	Find the sum of first 25 positive whole numbers by using Arithmetic Progression formuala
4	Find the sum of first 10 odd number by using Arithmetic Progression formuala
5	Find How many 3 didgits numbers are divisibe by 3 using Arithmetic Progression formuala
6	Find how many first 15 positive whole numbers are divisible by 8 Arithmetic Progression formuala
7	Find how many first 10 positive whole numbers are divisible by 11 Arithmetic Progression formuala
8	Find how many first 15 positive whole numbers are divisible by 2 & 3 Arithmetic Progression formuala

Learning points	Simultaneous equation in two variables
Class :-10	Marks -01
	Camparing ratios

Graphical represents	Ratios	Solution
Intersect lines	$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$	Unique Solution
Coincedent lines	$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$	Infinity many solution
Parallel Lines	$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$	No solution

Try your self		
1	$if\ a_1x + b_1y + c_1 = 0\ \ \&\ \ a_2x + b_2y + c_2 = 0$ *equation graphically represents a coinsedent coinsdent lines then the ratio are*	$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$
2	$if\ 2x + 3y - 9 = 0\ \ \&\ \ 4x + 6y - 18 = 0$ *eqution are graphically represnts then line are* April 2019	Coincident lines
3	If $x + 2y - 4 = 0\ \ \&\ \ 2x + 4y - 12 = 0$ graphically represents then lines are Sept 2020	Parallel lines
4	$if\ a_1x + b_1y + c_1 = 0\ \ \&\ \ a_2x + b_2y + c_2 = 0$ *equation have unique solution then te ratio are*	$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
5	if *two simaltenious equation have ratio* $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ *then the lines are*	Coincident lines
6	If two simultaneous equation have no solution then solution of equation June 2020	
7	$if\ \ a_1x + b_1y + c_1 = 0\ \ \&\ \ a_2x + b_2y + c_2 = 0$ equation have ratio $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ these have solution	
8	These $4x + 3y = 10\ \ \&\ \ 8x + 6y = 20$ equation have how many solution	

Simultaneous equation in two variables			
Class: 10		Marks :-2	
Learning point		Solving Simultaneous equation in two variables	
Model problem			
$x+y=14$ & $x-y=4$ Solve June 2019		2. $Solve$ $3x+2y=11$ & $5x-2y=13$	
$x+y=14$ -----(1) $x-y=4$ ..... (2) $2x \quad = 18$ $x=\frac{18}{2}$ $x=9$	Put x value in eq (1) $x+y=14$ $9+y=14$ $y=14-9$ $y=5$	$3x+2y=11$ ---(1) $5x-2y=13$--- (2) $8x \quad =24$ $x=\frac{24}{8}$ $x=3$	Put x value in eq (1) $3x+2y=11$ $3(3)+2y=11$ $9+2y=11$ $2y=11-9$ $y=\frac{2}{2}=1 \quad y=1$

	Try your self		Ans
1	Solve $2x+y=8$ & $x-y=1$	[April 2022]	$x=3, y=2$
2	Solve $2x+3y=7$ & $2x+y=5$	[July 2022]	$x=2, y=1$
3	Solve $2x+3y=11$ & $2x-4y=-24$	[September 2020]	$x=-2, y=5$
4	Solve $2x+y=11$ & $x+y=8$	[April 2020]	$x=3, y=5$
5	Solve $x+y=5$ & $2x-3y=5$		$x=4, y=1$
6	Solve $x+y=7$ & $x-y=1$		$x=4, y=3$
7	Solve $10x+3y=75$ & $6x-5y=11$	[MQP-1,2020]	$x=6, y=5$
8	Solve $x+y=8$ & $2y-x=1$	[MQP-2,2021]	$x=5, y=3$

Simultaneous equation in two variables	
Class 10	Marks :-4
Learning Points	Solve Simultaneous equation in two variables by graphically
Model problem	
Solve Simultaneous equation in two variables by graphically	
$x + y = 7$ & $3x - y = 1$	April 2020

Solution

$y = 7 - x$ -----(1)

$x = 0,\quad y = 7 - 0 = 7$

$x = 1\quad y = 7 - 1 = 6$

$x = 2\quad y = 7 - 2 = 5$

$x = 3\quad y = 7 - 3 = 4$

x	0	1	2	3
y	7	6	5	4

$y = 3x - 1$ ---(2)

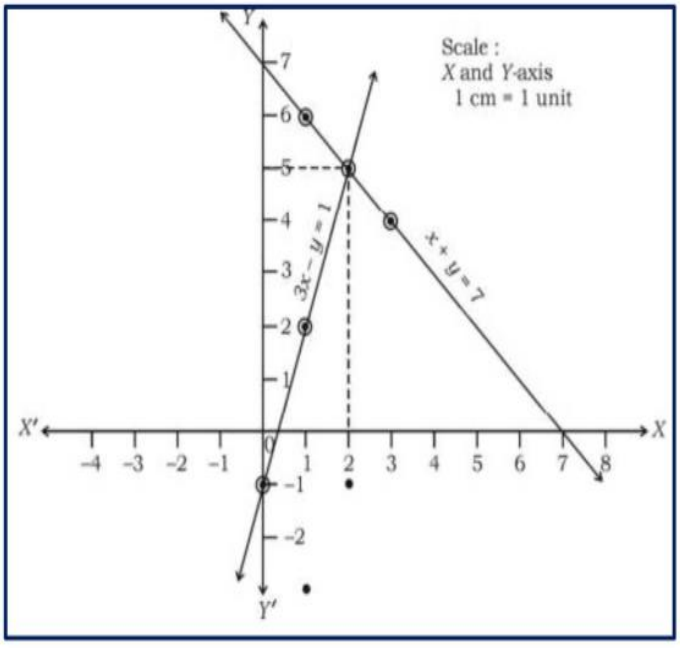
$x = 0,\quad y = 3(0) - 1 = 0 - 1 = -1$

$x = 1,\quad y = 3(1) - 1 = 3 - 1 = 2$

$x = 2\quad y = 3(2) - 1 = 6 - 1 = 5$

$x = 3\quad y = 3(3) - 1 = 9 - 1 = 8$

X	0	1	2	3
Y	-1	2	5	8



Solve Simultaneous equation in two variables by graphically:			
Try your self			Ans
1	$2x + y = 8$ & $x + y = 5$	[Sept -2020]	$x = 3$, $y = 2$
2	$2x + y = 8$ & $x - y = 1$	[June -2019]	$x = 3,$ $y = 2$
3	$2x + y = 6$ & $2x - y = 2$	[April -2019]	$x = 2,$ $y = 2$
4	$x + 2y = 6$ & $x - y = 5$	[April -2022]	$x = 4,$ $y = 1$
5	$2x - y = 7$ & $x - y = 2$	[June -2022]	$x = 5,$ $y = 3$
6	$x + y = 7$ & $3x - y = 1$		$x = 2,$ $y = 5$
7	$2x + y = 10$ & $x + y = 6$		$x = 4,$ $y = 2$
8	$2x - y = 2$ & $4x - y = 4$		$x = +1,$ $y = 0$
9	$x + y = 5$ & $x - y = 1$		$x = 3,$ $y = 2$
10	$x + y = 7$ & $x - y = 1$		$x = 4,$ $y = 3$
11	$2x + y = 10$ & $x + y = 6$		$x = 4,$ $y = 2$
12	$2x + y = 6$ & $2x - y = 2$		$x = 2,$ $y = 2$
13	$Y = 2x + 1$ & $x = 2y - 5$		$x = 1,$ $y = 3$
14	$x + y = -2$ & $2x - y = 8$		$x = 2,$ $y = -4$
15	$x + y = 10$ & $x - y = 2$		$x = 4,$ $y = 6$
16	$x + y = 14$ & $x - y = 4$		$x = 9,$ $y = 15$

Learning points	Topic:-Coordinate geometry
Class: 10	Assigned marks:-1
Solving learning points	Finding distance from origin using formula.
Formula to be used	$\therefore d = \sqrt{x^2 + y^2}$
Points to be remembered	1^2=1, 2^2=4, 3^2=9, 4^2=16, 5^2=25, 6^2=36,$(-2)^2$=4 $\sqrt{25}$=5, $\sqrt{36}$=6, $\sqrt{49}$=7, $\sqrt{100}$=10

Examples

1. Find the distance between the points (-6,8) and origin.

$$\therefore d = \sqrt{(x)^2 + (y)^2}$$
$$d = \sqrt{(-6)^2 + (8)^2}$$
$$= \sqrt{36 + 64}$$
$$= \sqrt{100}$$
$$\therefore d = 10 \text{ units}$$

X	Y
-6	8

" It's very easy, Try this, It's possible by you also"	Answer
1. Find the distance between the points (3,4) and origin.	d=5 units
2. Find the distance between the points (5,4) and origin.	$d = \sqrt{41}$ units
3. Find the distance between the points P(4,3) and origin.	4units
4. Find the distance from x-axis and point A (5,2)	2 units
5. Find the distance between the points P(a,b) and origin.	$d = \sqrt{a^2 + b^2}$
6. Find the distance between the points (7,24) and origin.	d=25 units
7. Find the distance between the points (5,12) and origin.	d=13 units
8. Find the distance between the points (-8,15) and origin.	d=17 units
9. Find the distance between the points (x, y) and origin.	$\sqrt{x^2 + y^2}$

Learning points	Topic:-Coordinate geometry
Class: 10	Assigned marks:-2
Solving learning points	Find the distance between the points by using formula
Formula to be used	$\therefore d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Points to be remembered	1^2=1, 2^2=4, 3^2=9, 4^2=16, 5^2=25, 6^2=36,$(-2)^2$=4 $\sqrt{25}$=5, $\sqrt{8} = 2\sqrt{2}$, $\sqrt{36}$=6

Examples

1. Find the distance between the points A (2, 6) and B(5, 10) by using formula

$$\therefore d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$d = \sqrt{(5-2)^2 + (10-6)^2}$$
$$= \sqrt{3^2 + 4^2}$$
$$= \sqrt{9 + 16}$$
$$= \sqrt{25}$$
$$\therefore d = 5 \text{ units}$$

x_1	y_1	x_2	y_2
2	6	5	10

" It's very easy, Try this, It's possible by you also"	Answer
1. Find the distance between the points P (2,3) and Q(4, 1) by using formula.	$2\sqrt{2}$
2. Find the distance between the points (3, 1) and (6,2) by using formula.	$\sqrt{10}$
3. Find the distance between the points (2,3) and (6,-8) by using formula.	$\sqrt{32} = 2\sqrt{8}$
4. Find the distance between the points (-5, 7) and (-1,3) by using formula.	$4\sqrt{2}$
5. Find the distance between the points (2, 3) and (0,-9) by using formula.	$2\sqrt{10}$
6. If the distance between the points (3, 1) and (0,-x) is 5 units then find value of 'x'.	x=5
7. If the distance between the points (k,3) and (2,3) is 5 units then find value of '*k*'.	k=-3
8. Find the distance between the points (1,3) and (3,7) by using formula.	$2\sqrt{5}$

Learning points	Topic:-Coordinate geometry
Class: 10	Assigned marks:-2
Solving learning points	Finding coordinates of midpoint of two points
Formula to be used	$\therefore P(x,y) = \left[\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2}\right]$
Points to be remembered	

Examples

1. Find the coordinates of the mid-point of the line segment joining the points P(3,4) and Q(5,6)

Solution:

$$\therefore P(x,y) = \left[\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2}\right]$$

$$\therefore P(x,y) = \left[\frac{5+3}{2}, \frac{6+4}{2}\right]$$

$$= \left[\frac{8}{2}, \frac{10}{2}\right]$$

$$\therefore P(x,y) = (4,5)$$

x_1	y_1	x_2	y_2
3	4	5	6

" It's very easy, Try this, It's possible by you also"	Answer
1. Find the coordinates of the mid-point of the line segment joining the points (2,3) and (4,7)	(3, 5)
2. Find the coordinates of the mid-point of the line segment joining the points (3,2) and (7,8).	$(5,5)$
3. Find the coordinates of the mid-point of the line segment joining the points (4,5) and (8,-1).	$(6,2)$
4. Find the coordinates of the mid-point of the line segment joining the points (-4,2) and (-2,6).	$(-3,4)$
5. Find the coordinates of the mid-point of the line segment joining the points (-3,-2) and (7,8).	$(2,3)$
6. Find the coordinates of the mid-point of the line segment joining the points (1,2) and (-7,6).	$(-3,4)$
7. Find the coordinates of the mid-point of the line segment joining the points (4,7) and (2,-3).	$(3,2)$

Learning points	Topic:-Coordinate geometry
Class: 10	Assigned marks:-2
Solving learning points	Find the coordinates of the point which divides the line joining the points $A(x_1,y_1)$ and $B(x_2,y_2)$ in the ratio $m_1:m_2$
Formula to be used	$\therefore P(x,y)=\left[\frac{m_1x_2+m_2x_1}{m_1+m_2},\frac{m_1y_2+m_2y_1}{m_1+m_2}\right]$

Examples

1. In the what ratio does the point $P(-4,6)$ divide the line segment joining the points A(-6,10) & B (3,-8)

Solution :- $(x_1,y_1)=(-6,10),\ (x_2,y_2)=(3,-8),\ P(x,y)=(-4,6)\quad m_1:m_2=?$

$$P(x,y)=\left[\frac{m_1x_2+m_2x_1}{m_1+m_2},\frac{m_1y_2+m_2y_1}{m_1+m_2}\right]$$

$$P(-4,6)=\left[\frac{m_1(3)+m_2(-6)}{m_1+m_2},\frac{m_1(-8)+m_2(10)}{m_1+m_2}\right]$$

$$=\left[\frac{m_1(3)+m_2(-6)}{m_1+m_2},\frac{m_1(-8)+m_2(10)}{m_1+m_2}\right]$$

x ¤zÉÃð±ÁAPÀUÀ¼À£ÀÄß ¸ÀjzÀÆV¹zÁUÀ

$-4=\frac{3m_1-6m_2}{m_1+m_2}$,

$-4m_1-4m_2=3m_1-6m_2$

$4m_1+3m_1=6m_2-4m_2$

$7m_1=2m_2$

$\frac{m_1}{m_2}=\frac{2}{7}$

$m_1:m_2=2:7$

2.Find the coordinates of the point which divides the line joining the points (1,6) and (4, 3) in the ratio 1: 2.

Solution :- $(x_1,y_1)=(1,6),\ (x_2,y_2)=(4,3),\ m_1:m_2=1:2,\ P(x,y)=?$

$$P(x,y)=\left[\frac{m_1x_2+m_2x_1}{m_1+m_2},\frac{m_1y_2+m_2y_1}{m_1+m_2}\right]$$

$$\therefore P(x,y)=\left[\frac{1(4)+2(1)}{1+2},\frac{1(3)+2(6)}{1+2}\right]$$

$$=\left[\frac{4+2}{3},\frac{3+12}{3}\right]$$

$$=\left[\frac{6}{3},\frac{15}{3}\right]$$

$$\therefore P(x,y)=P(2,5)$$

" It's very easy, Try this, It's possible by you also"	Answer
1. Find the coordinates of the point which divides the line joining the points A(4, -3) and B (8,5) in the ratio 3:1.	(7, 3)
2. Find the coordinates of the point which divides the line joining the points (2, 1) and (7,6) in the ratio 3:2.	(5, 4)
3. Find the coordinates of the point which divides the line joining the points (-3,5) and (4,-9) in the ratio 1:6.	$(-2,3)$
4. Find the coordinates of the point which divides the line joining the points (-2,7) and (3,-3) in the ratio 3:2.	$(1,1)$
5. Find the coordinates of the point which divides the line joining the points (-3,5) and (4,-9) in the ratio 1:6.	$(-2,3)$
6. Find the coordinates of the point which divides the line joining the points (-3,6) and (1,-2) in the ratio 1:3	$(-\frac{1}{2},4)$

Learning points	Topic:-Statistics
Class: 10	Assigned marks:-3
Solving learning points	Finding mean
Formula to be used	$= \bar{x} = \frac{\Sigma f_i x_i}{\Sigma f_i}$

Examples

Find the mean for the following grouped

Class-interval	Frequency	Mid-point $f_i x_i$	$f_i x_i$
0-10	3	05	15
10-20	5	15	75
20-30	9	25	225
30-40	5	35	175
40-50	3	45	135
$\Sigma f_i = 25$		$\Sigma f_i x_i = 625$	

$$Mean \quad = \bar{x} = \frac{\Sigma f_i x_i}{\Sigma f_i}$$

$$= \frac{625}{25}$$

$$\bar{x} = 25$$

" It's very easy, Try this, It's possible by you also"									Answer
Find the mean for the following grouped data by Direct Method:									
1	Class-interval	5-15	15-25	25-35	35-45	45-55			$\Sigma f_i x_i = 625$
	Frequency	1	3	5	4	2			$\bar{x} = 32$
2	Class-interval	0-4	5-9	10-14	15-19	20-24			$\Sigma f_i x_i = 240$
	Frequency	1	5	8	5	1			$\bar{x} = 12$
3	Class-interval	10-20	20-30	30-40	40-50	50-60			$\Sigma f_i x_i = 760$
	Frequency	2	3	5	7	3			$\bar{x} = 30$
4	Class-interval	5-15	15-25	25-35	35-45	45-55			$\Sigma f_i x_i =$
	Frequency	4	3	6	5	2			$\bar{x} = 24$
5	Class-interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	
	Frequency	3	8	10	15	7	4	3	$\bar{x} = 32.8$
6	Class-interval	5-15	15-25	25-35	35-45	45-35			
	Frequency	06	11	21	23	14			$\bar{x} = 35.37$
7	Class-interval	0-10	10-20	20-30	30-40	40-50			
	Frequency	5	12	14	11	08			$\bar{x} = 26$

Learning points	Topic:-Statistics
Class: 10	Assigned marks:-3
Solving learning points	Finding mean
Formula to be used	Mean $=\bar{x}=\frac{\epsilon f_x}{n}$

Find the mean for the following grouped

Class-interval	Frequency	x	fx
100-120	12	110	1320
120-140	14	130	1820
140-160	8	150	1200
160-180	6	170	1020
180-200	10	190	1900
	N=50		$\epsilon f_x = 7260$

$$\bar{x}=\frac{\epsilon f_x}{n}$$
$$\bar{x}=\frac{7260}{50}$$
$$\bar{x}=142.5$$

" It's very easy, Try this, It's possible by you also"

Answer

Find the mean for the following grouped data by Direct Method:

1	Class-interval	1-5	5-9	9-13	13-17	17-21			
	Frequency	4	3	5	7	1			$\bar{x}=0.6$
2	Class-interval	5-15	15-25	25-35	35-45	45-55	55-65		
	Frequency	6	11	7	5	6			$\bar{x}=38.25$
3	Class-interval	10-30	30-50	50-70	70-90				
	Frequency	2	6	10	2				$\bar{x}=52$
4	Class-interval	5-15	15-25	25-35	35-45	45-55			
	Frequency	4	3	6	5	2			$\bar{x}=29$
5	Class-interval	1-3	3-5	5-7	7-9	9-11			
	Frequency	7	8	2	2	1			
6	Class-interval	10-30	30-50	50-70	70-90				
	Frequency	2	6	10	12				$\bar{x}=61.33$

Learning points	Topic:-Statistics
Class: 10	Assigned marks:-3
Solving learning points	Finding Median
Formula to be used:	Median $=l+\left[\frac{\frac{n}{2}-c.f}{f}\right]\times h$

Examples

1) Calculate the median of the following frequency distribution table.

Class-interval	Frequency
1-4	6
4-7	30
7-10	40
10-13	16
16-19	4
	$\Sigma f_i = 100$

Solution:

Class-interval	Frequency	CF
1-4	6	6+0=6
4-7	30	*6+30=36->cf*
l -> 7-10	f -> 40	36+40=76
10-13	16	76+16=92
13-16	4	92+04=96
16-19	4	96+04=100
	$\Sigma f_i = 100$	

$\frac{n}{2}=\frac{100}{2}=50$ median class -> 7 -10

l= Lower limit of the median class =7

h = class size = 4-1=3

cf =Cumulative Frequency of class preceding the median class= 36

f Frequency of median class =40

n= $\Sigma f_i = 100$= 100

Median =$l + \left[\frac{\frac{n}{2} - c.f}{f}\right] \times h$

=$7 + \left[\frac{50-36}{40}\right] \times 3$

=$7 + \left[\frac{14}{40}\right] \times 3$

=$7 + \left[\frac{7}{20}\right] \times 3$

=$7 + \left[\frac{21}{20}\right]$

= 7+1.05 = Median = 8.05

" It's very easy, Try this, It's possible by you also"									Answer
Find the median for the following grouped data by Direct Method:									
1	Class-interval	0-20	20-40	40-60	60-80	80-100			median =50
	Frequency	6	9	10	8	7			
2	Class-interval	1-4	4-7	7-10	10-13	13-16	16-19		median=8.05
	Frequency	6	30	40	16	4	4		
3	Class-interval	20-40	40-60	60-80	80-100				median =63
	Frequency	7	15	20	8				
4	Class-interval	1-3	3-5	5-7	7-9	9-11			median =5
	Frequency	6	9	15	9	1			
5	Class-interval	1-3	3-5	5-7	7-9	9-11			median =3.6
	Frequency	6	9	2	6	7			
6	Class-interval	0-10	10-20	20-30	30-40	40-50			median =3.6
	Frequency	7	9	15	11	8			

	Statistics
class:-10	Marks :-3
Teaching point	To find the median
To use formula :	median $=l+\left[\frac{\frac{n}{2}-c.f}{f}\right]\times h$

Solved examples

1) Find the median of the following data

Class interval	frequency
1-4	6
4-7	30
7-10	40
10-13	16
16-19	4
	$\Sigma f_i = 100$

solution:

Class interval	frequency	Cumulative frequency
1-4	6	6+0=6
4-7	30	*6+30=36->cf*
l -> 7-10	f -> 40	36+40=76
10-13	16	76+16=92
13-16	4	92+04=96
16-19	4	96+04=100
	$\Sigma f_i = 100$	

$\frac{n}{2}=\frac{100}{2}=50$, median= 50th score , median class; 7 -10

l= lower limits of median class = 7

h = class size = 4-1=3

cf = c.f ,of class preceding median class = 36

f = frequency of the median class =40

n = number of observations=100

median=$l + \left[\frac{\frac{n}{2} - c.f}{f}\right] \times h$

$=7 + \left[\frac{50-36}{40}\right] \times 3$

$=7 + \left[\frac{14}{40}\right] \times 3$

$=7 + \left[\frac{7}{20}\right] \times 3$

$=7 + \left[\frac{21}{20}\right]$

= 7+1.05 =8.05 $\Longrightarrow$ median = 8.05

Try Solve these									
Find the median of the following data									answers
1	Class intervals	0-20	20-40	40-60	60-80	80-100			median =50
	frequency	6	9	10	8	7			
2	Class intervals	1-4	4-7	7-10	10-13	13-16	16-19		median =8.05
	frequency	6	30	40	16	4	4		
3	Class intervals	20-40	40-60	60-80	80-100				median =63
	frequency	7	15	20	8				
4	Class intervals	1-3	3-5	5-7	7-9	9-11			median =5
	frequency	6	9	15	9	1			
5	Class intervals	1-3	3-5	5-7	7-9	9-11			median =3.6
	frequency	6	9	2	6	7			
6	Class intervals	0-10	10-20	20-30	30-40	40-50			median =3.6
	frequency	7	9	15	11	8			

	Statistics
class:-10	Marks :-3
Learning points	To find the mode
Using the formula :	mode $= l + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h$

Solved example

1) Find the mode for the following grouped data

Class intervals	frequency
10-25	2
25-40	3
40-55	7
55-70	6
70-85	6
85-100	6
	$\Sigma f_i = 30$

Solution ;

Class intervals	frequency
10-25	2
25-40	$f_0 \rightarrow 3$
$l \rightarrow 40 - 55$	$f_1 \rightarrow 7$
55-70	$f_2 \rightarrow 6$
70-85	6
85-100	6
	$\Sigma f_i = 30$

Highest frequency->7 the modal class is -> 40-55

l =lower limit of the modal class = 40

h = size of the class interval (assuming all class sizes to be equal)

= upper limits- lower limits

=25-10=15

f_0 =Frequency of the class preceding the modal class = 3

f_1 =frequency of the modal class = 7

f_2 =frequency of the class succeeding the modal class = 7

mode $= l + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h$

$= 40 + \left[\frac{7-3}{2\times7-3-6}\right] \times 15$

$= 40 + \left[\frac{4}{14-9}\right] \times 15$

$= 40 + \left[\frac{4}{5}\right] \times 15$

$= 40 + [4 \times 3]$

$= 40 + 12$

mode = 52

Try to solve these								
Find the mode for the following grouped data								answer
1	Class intervals	5-15	15-25	25-35	35-45	45-55		mode = 33
	Frequency	3	4	8	7	3		
2	Class intervals	0-5	5-10	10-15	15-20	20-25		mode = 6
	Frequency	6	30	40	16	4		
3	Class intervals	0-2	2-4	4-6	6-8	8-10		mode = 5.5
	Frequency	1	3	6	5	2		
4	Class intervals	1-3	3-5	5-7	7-9	9-11		mode = 6
	Frequency	6	9	15	9	1		
5	Class intervals	0-20	20-40	40-60	60-80	80-100		mode = 72
	Frequency	15	10	35	50	40		
6	Class intervals	10-25	25-40	40-55	55-70	70-85	85-100	mode = 52
	Frequency	2	3	7	6	6	6	

Learning Outcome	Chapter : Area related to Circles
Class:-10	Marks allotted:-01/02
Learning Points	To find the area of the sector and the length of the Arc in a circle
Formula to be used:	Length of Arc = $\frac{\theta}{360^0}\boldsymbol{2\pi r}$ Area of Sector = $\frac{\theta}{360^0}\boldsymbol{\pi r^2}$ Area of a Quadrant of a Circle = $\frac{1}{4}\times\boldsymbol{\pi r^2}\ (\theta = 90^0)$

SAMPLE CALCULATION

1) A circle of radius 21cm subtends an angle at the centre. Find the length of the Arc.	2) Find the area covered by the minute hand of a clock 14 cm long in 5 minutes.
Solution : $\theta = 60^0$ $R = 21cm$ Length of Arc = $\frac{\theta}{360^0}\boldsymbol{2\pi r}$ $=\frac{60^0}{360^0}\times 2\times\frac{22}{7}\times 21$ $=\frac{1}{6}\times 2\times 22\times 3$ $= 22cm$	Solution: Length = radius = 14 cm Angle traversed in 3 minutes = 30^0 Area of Sector = $\frac{\theta}{360^0}\boldsymbol{\pi r^2}$ $= \frac{30}{360^0}\times\frac{22}{7}\times 14^2$ $=\frac{154}{3}cm^2$

"SO EASY, YOU CAN DO IT TOO, JUST GIVE IT A TRY"

1	If the circumference of a circle is numerically equal to its area, find the radius of the circle. $\boldsymbol{r}$=2	$\boldsymbol{r}$=2
2	The area of a circle is $49\boldsymbol{\pi r}$ square meters but its perimeter is 14 $\boldsymbol{\pi}$	$14\boldsymbol{\pi}$
3	In a circle of radius 21 cm, the arc subtends an angle at the centre. Find the length of the Arc. 33 Cm	33cm
4	In a circle of radius 24cm, the arc subtends an angle at the centre. Find the length of the Arc. 2 cm	2cm
5	An umbrella has 8 equally spaced rods. Assuming that the umbrella is a flat circle of radius 45 cm, find the area between two consecutive poles.	$A=\frac{22752}{28}cm^2$
6	Find the radius and the radius angle between the radii and its width.	$A=\frac{132}{4}\ cm^2$
7	Find the area of a quadrant whose perimeter is 22 cm.	$A=\frac{77}{8}cm^2$

Learning Outcome	Chapter : Mensuration
Class:-10	Marks assigned:-01/02
LEARNING Points	To find the lateral and total surface area of a cube, find the cube

Solids	Curved Surface Area	Total Surface Area	Area Volume
Cylinder	$\boldsymbol{2\pi r}$h	$\boldsymbol{2\pi r}$(r+h)	$\pi r^2 h$
Cone	$\boldsymbol{\pi r}l$	$\pi r(r+l)$	$\frac{1}{3}\pi r^2 h$
Frustuf	$\pi(r_1+r_2)l$	$\pi(r_1+r_2)l+\pi(r_1^2+r_2^2)$	$\frac{1}{3}\pi h(\pi(r_1^2+r_2^2+(r_1+r_2)$
the Sphere	-	$4\pi r^2$	$\frac{4}{3}\pi r^3$
Hemisphere	$2\pi r^2$	$3\pi r^2$	$\frac{2}{3}\pi r^3$

1) The radius of a cone is 7cm and the slant height is 10 cm. Find the lateral surface area of the cone.	2) A cone is melted and a Sphere of same radius is made. Find the ratio of the height and the radii.
Lateral Surface Area = $\boldsymbol{\pi r}l$ $= \frac{22}{7} \times 7 \times 10$ $= 229\ cm^2$	$\frac{1}{3}\pi r^2 h = \frac{4}{3}\pi r^3 = h = 4r$ $\Rightarrow \frac{h}{r} = \frac{4}{1} \Rightarrow h:r = 4:1$

"SO EASY, YOU CAN DO IT TOO, JUST GIVE IT A TRY"

1.	The surface area of the sphere of Radius 7cm.	$616m^2$
2.	The volume of the Cylinder is 300cm^3 then what is volume of a Cone whose redious and height are equal to the cylinder?	$100m^3$
3.	The ratio of volumes of two spheres is 64:27 then what is the ratio of their surface areas?	$\frac{16}{9}$
4	The slant height of a frustum is 4 cm and the circumferences of its circular feet are 18 cm and 6 cm. Find the lateral surface area of the frustum. 48 sq. cm	48 sq.cm.
5	The radius of a cone is 7cm and the slant height is 10cm. Find the lateral surface area of the cone.	$229cm^2$
6	The formula for finding the surface area of a right circular cylinder is $\boldsymbol{2\pi r}$ (D+h)	$\boldsymbol{2\pi r}$(r+h)
7	The formula for finding the volume of a frustum	$\frac{1}{3}\pi h(\pi(r_1^2+r_2^2+(r_1+r_2)$

Chapter : Introduction to Trigonometry	
Class:-10:	Marks allotted:- 01/02
Learn to find	the distance, height, length and value of an object given the given data.
Formula to be used	

Supplementary angles

$\sin(90^0-\theta)=\cos\theta$ $\quad\quad$ $\cos(90^0-\theta)=\sin\theta$

$\text{cosec}(90^0-\theta)=\sec\theta$ $\quad\quad$ $\sec(90^0-\theta)=\text{cosec}\theta$

$\tan(90^0-\theta)=\cot\theta$ $\quad\quad$ $\cot(90^0-\theta)=\tan\theta$

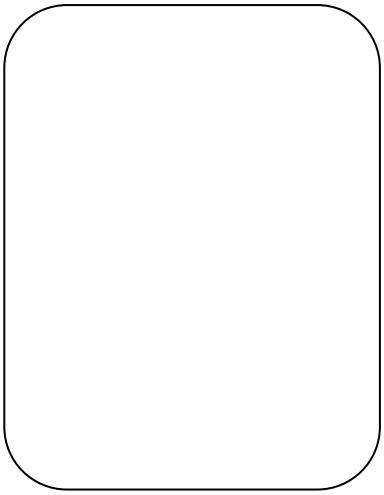
$\sin\theta=\frac{PQ}{OP}=\frac{A}{V}$

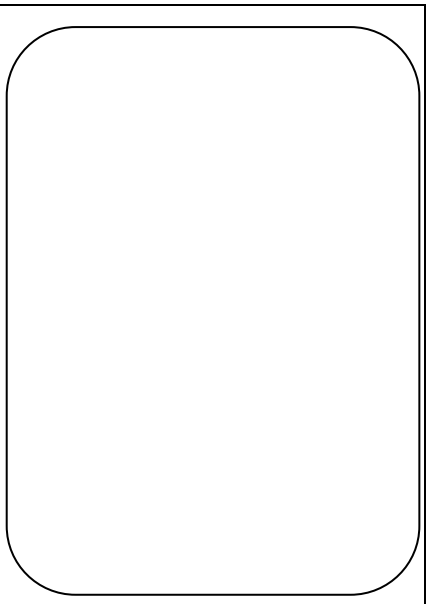
$\cos\theta=\frac{OQ}{OP}=\frac{P}{V}$

$\tan\theta=\frac{PQ}{OQ}=\frac{A}{P}$

AV, PV, AP

A=aspect V=diagonal Pa=lateral





$sin^2\theta+cos^2\theta=1$ $1-sin^2\theta=cos^2\theta$ $1-cos^2\theta=sin^2\theta$	$1+tan^2\theta=sec^2\theta$ $tan^2\theta-sec^2\theta=1$ $sec^2\theta-1=tan^2\theta$	$1+cot^2\theta=cosec^2\theta$ $cot^2\theta-cosec^2\theta=1$ $cosec^2\theta-1=cot^2\theta$

SAMPLE CALCULATION
1. A kite is flying at a height of 60m above the ground and its string is temporarily tied to a peg at a point on the ground. Find the length of the string assuming that the string makes an angle of 60^0 with the ground and is not slack.

Solution:
Height of Kite = M=mh=60m
Length of thread =AB =
In a right angle triangle - ΔABC
Sin 60^0 =$\frac{BC}{AB}$
=$\frac{\sqrt{3}}{2}$=$\frac{60}{AB}$
Length of thread = AB=$\frac{60\times2}{\sqrt{3}}$=$\frac{120}{\sqrt{3}}$=$40\sqrt{3}$

	0^0	30^0	45^0	60^0	90^0
Sinθ	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
Cosθ	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
Tanθ	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	ND
Cosecθ	ND	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1
Secθ	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	ND
Cotθ	ND	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0

"SO EASY, YOU CAN DO IT TOO, JUST GIVE IT A TRY"

1	A circus artist is climbing a rope 20m long and tied to the ground with a vertical suspension A. The angle between the rope and the ground is 30^0 but the vertical height is 10m.	
2	A tree breaks in a storm and hits the ground making an angle of 30^0 with the ground and the top of the tree reaches the ground at a distance of 8 m from the base of the tree. Then find the height of the tree before it broke.	
3	The angle of declination formed by a car on the ground from the top of a building $50\sqrt{3}$ high is 60^0. Find the distance of the car from the base of the building.	
4	If $\sin\theta = \frac{3}{5}$ & $\cos\theta = \frac{4}{5}$ then find the value of $sin^2\theta+cos^2\theta$	
5	find the value of $\sin60^0\cos30^0+\sin30^0\cos60^0$	
6	$\cos A = \frac{4}{5}$ then find the value of tanA	
7	find the value of $\tan\theta - \cot(90^0-\theta)$	13 $\sin\theta = 12$ but $\cos\theta$ find the value
8	find the value of $\sin60^0 \times\cos30^0$	

Chapter Probability	
Class: 10	Assigned Marks: 01/02
P(e)=0.05 then find p(ē) Solution: p(e)+ p(ē)=1 0.05 +p(ē)=1 p(ē)=1-0.05 p(ē)=0.95	P(A) = 2/3 then find P($\bar{A}$) P(A)+ P($\bar{A}$)= 1 P($\bar{A}$)= 1-2/3 P($\bar{A}$)=1/3

1. IF probability of event is done is 0.92 then find the probability of event not done
2. IF probability of event is not done is 0.32 then find the probability of event done
3. A coin is thrown 3 times .what is the probability that atleast one head is obtained?
4. Find the probability of getting a numbered card when a card is drawn from the pack of 52 cards.
5. Two dice are thrown at the same time. Find the probability of getting
   (i) the same number on both dice.
   (ii) different numbers on both dice.

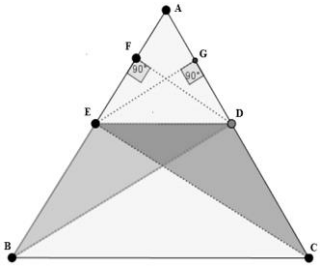
Theorem 1 : Thales Theorem OR (Basic Proportionality Theorem).

"A line drawn parallel to one side of a triangle divides the other two sides in the same ratio."

Proof:-

Given:-In ΔABC, DE||BC

To Prove: $\frac{AE}{BE} = \frac{AD}{CD}$



Construction: Join BD and CE and Draw FD ⊥ AB and EG ⊥ AC.

Proof:

Consider ΔADE and ΔBDE

We know that

$\frac{\text{Area of } \Delta ADE}{\text{Area of } \Delta BDE} = \frac{\frac{1}{2}AE \times \cancel{DF}}{\frac{1}{2}BE \times \cancel{DF}} \Rightarrow \frac{\Delta ADE}{\Delta BDE} = \frac{AE}{BE} - (1) \left[Area\ of\ \Delta = \frac{1}{2} B \times H\right]$

Similarly, Consider ΔADE and ΔCDE

$\frac{\Delta ADE}{\Delta CDE} = \frac{\frac{1}{2}XADX\cancel{EG}}{\frac{1}{2}XCDX\cancel{EG}} \Rightarrow \frac{\Delta ADE}{\Delta CDE} = \frac{AD}{CD} - (2)$

Since, ED||BC we know that area triangle between same base and same parallel is equal, So Area of ΔBDE= Area of ΔCDE. Now from eq. (1) and (2)

$\Rightarrow \frac{\Delta ADE}{\Delta BDE} = \frac{\Delta ADE}{\Delta CDE}$

$\Rightarrow \frac{AE}{BE} = \frac{AD}{CD}$

Hence Proved.

Theorem 2: Angle-Angle-Angle Criterion of Similarity of two triangles:

"If in two triangles, corresponding angles are equal, then their corresponding sides are in the same ratio (or proportion) and hence the two triangles are similar."

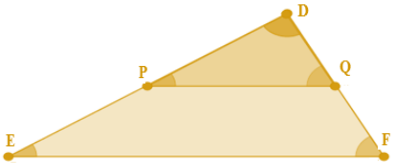
Given: In ΔABC and ΔDEF ∠A = ∠D, ∠B = ∠E, ∠C = ∠F

To Prove: ΔABC ~ ΔDEF ; $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

Construction: Cut DP =AB from DE and DQ=AC from DF and join PQ.

Proof:

Consider ΔABC and ΔDPQ



Here ∠BAC = ∠PDQ [Data]

AB=DP, AC=DQ[Construction]

ΔABC = ΔPDQ [SAS Congruence rule]

∠ABC = ∠DPQ [CPCT]

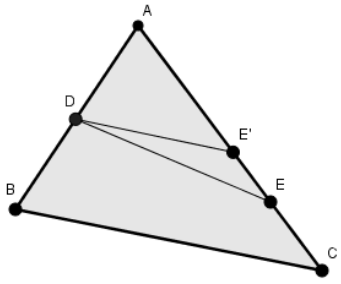
But ∠ABC = ∠DEF [Data]

⇒∠DPQ=∠DEF. Therefore, PQ || EF[Since corresponding angles are equal].

$\frac{DP}{DE} = \frac{PQ}{EF} = \frac{DQ}{DF}$ [By corollary of BPT]

$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$ [By construction] Hence this completes the proof.

Converse of BPT: If a line divide any two sides of a triangle (Δ) in the same ratio, then the line must be parallel (||) to third side.



Given: In triangle $\frac{AD}{DB} = \frac{AE}{EC}$

To Prove: DE||BC

Construction: DE'||BC

Proof : Here $\frac{AD}{DB} = \frac{AE}{EC}$ ----(1)Since DE'||BC,

So by BPT $\frac{AD}{DB} = \frac{AE'}{E'C}$ by(1)

$\Rightarrow \frac{AE}{EC} + 1 = \frac{AE'}{E'C} + 1$

$\Rightarrow \frac{AE+EC}{EC} = \frac{AE'+E'C}{E'C}$

$\Rightarrow \frac{AC}{EC} = \frac{AC}{E'C}$

so E and E' are same

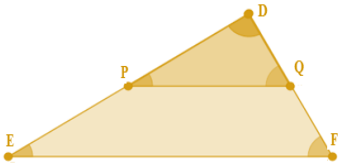
Hence DE||BC.

SSS similarity criterion of two triangle: If in two triangles, sides of one triangle are proportional to the sides of the other triangle, then their corresponding angles are equal and hence the triangles are similar.

Given: In ΔABC and ΔDEF, $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

To Prove: ∠A = ∠D, ∠B = ∠E, ∠C = ∠F, ΔABC ~ ΔDEF

Construction: Cut DP =AB from DE and DQ=AC from DF and join PQ.



Proof: Consider ΔABC and ΔDPQ

$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} \Rightarrow \frac{DP}{DE} = \frac{PQ}{EF} = \frac{DQ}{DF}$

⇒PQ||EF (By BPT) So, ∠P = ∠E & ∠Q=∠F ∵PQ||EF

ΔABC≅ΔDPQ So, ∠A=∠D, ∠B=∠P, ∠C=∠Q

⇒∠A=∠D, ∠B=∠E, ∠C=∠F So ΔABC ~ ΔDEF

Hence this completes the proof.

SAS similarity criterion of two triangle: If one angle of a triangle is equal to one angle of the other triangle and the sides including these angles are proportional, then the two triangles are similar.

Given: In ΔABC and ΔDEF, $\frac{AB}{DE} = \frac{AC}{DF}$, ∠A=∠D

To Prove: ΔABC ~ ΔDEF

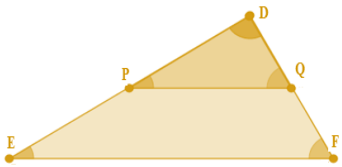
Construction: Cut DP =AB from DE and DQ=AC from DF and join PQ.

Proof: Consider ΔABC and ΔDPQ

$\frac{AB}{DE} = \frac{AC}{DF}$, ∠A=∠D, PQ||EF, ΔABC≅ΔDPQ,

∠A=∠D, ∠B=∠P, ∠C=∠Q

∴ΔABC≅ΔDEF



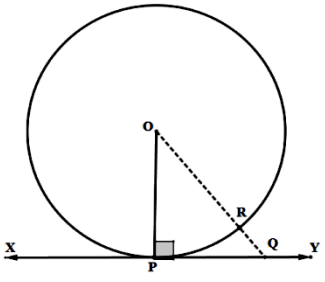
Circle theorem 1

"The tangent at any point of a circle is perpendicular to the radius drawn at the point of contact".

Data: O is the centre of the circle .XY is the tangent to the circle at the point P .OP is the radius drawn at the point of contact P.

To Prove : OP ⊥ XY.

Construction : Take a point Q on XY .Join OQ.



Proof : OQ=OR+RQ

⇒OQ=OP+RQ (OP=OR)

⇒ OQ>OP

⇒ ∴OQ is longer than OP.

So, OP is the smallest distance of the point O from the line XY.

⇒OP ⊥ XY.

Hence proved.

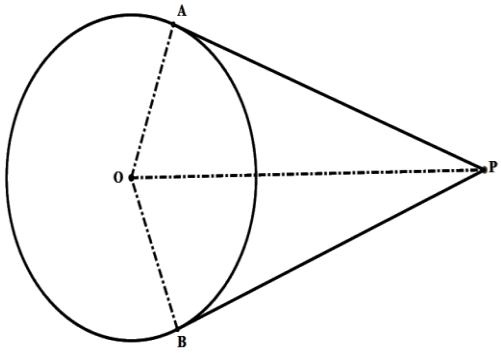
Circle theorem 2

"The two tangents drawn from an external point to a circle are equal".

Data : O is the centre of the circle .P is an external point.

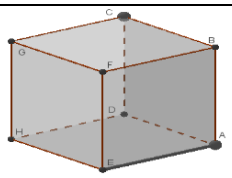
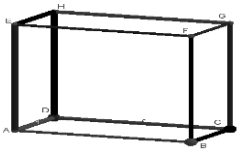
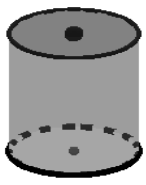
AP and BP are tangents to the circle.

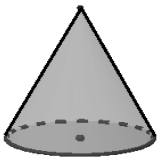
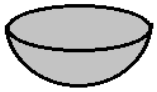
To Prove : AP =BP
Construction: Join OA,OB and OP
Proof : In Δ AOP and Δ BOP,
∠OAP =∠OBP [Right angles]
OA =OB [Radii of the same circle]
OP=OP [Common side]
∴ΔAOP ≅ΔBOP [RHS Theorem]
∴ AP=BP [C.P.C.T]
Hence proved.



Formula:

- The roots of the quadratic equation $ax^2+bx+c=0$ is given by ; $x = \frac{-b\pm\sqrt{b^2-4ac}}{2a}$
- $\Delta=b^2-4ac$
- Distance formula:-
- $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ Units
- Distance from origin:
- $d = \sqrt{x^2 + y^2}$ Units.
- Section formula:
- $p(x,y) = (\frac{m_1x_2+m_2x_1}{m_1+m_2}, \frac{m_1y_2+m_2y_1}{m_1+m_2})$
- $p(x,y) = (\frac{x_2+x_1}{2}, \frac{y_2+y_1}{2})$

Sl. No	Solid	Shape	CSA	TSA	Volume
1.	Cube		$4a^2$	$6a^2$	a^3
2.	Cuboid		2h(l+b)	2(lb+bh+lh)	lbh
3.	Cylinder		$2\pi rh$	$2\pi r(h+r)$	πr^2h

4.	Cone		πrl	$\pi r(l+r)$	$\frac{1}{3}\pi r^2 h$
5.	Sphere		$4\pi r^2$	$4\pi r^2$	$\frac{4}{3}\pi r^3$
6.	Hemi-sphere		$2\pi r^2$	$3\pi r^2$	$\frac{2}{3}\pi r^3$