Math

Algebra

1) Complete:-

1- F(x) = X – 5 its domain ……

2- If F: $R^{+} \rightarrow R$, F (x) = x^2, then F is ……

[Even – odd – otherwise]

3- The domain F: f(x) = $\sqrt{-x}$ is ……

4- The range of the function f (x) = $|x+3|$ -3 is ……

5- The S.S of $|2x-1| \leq 7$ in R is ……

6- The S.S of $|x-1| < 2$ in R is ……

7- The vertex of the curve F(x) = 2- $(x+1)^2$

8- The domain of the function F (x) = $\frac{x}{\sqrt[3]{x}-2}$

9- The range of the function F(x) = 5 is ……

10- The domain of f (x) = $\sqrt{1-x}$ is ……

11- F(x) is an even function then $\frac{f(a)+f(-a)}{f(a)}$= ……

12- The S.S of $|x| \leq 0$ is ……

13- The S.S of $|x-3|$ =1, then S.S ……

14- The range of f(x) = $(x+3)^2$ -3 is ……

15 – The function f(x) = $|x|$ is increasing on ……

16- The equation of axis of symmetry of f(x) = $5(x+2)^2$ - 4

Math

1) Graph each of the following functions then from the graph. Find the range and Monotonocity

2) Show whether it is even or odd.

a) $F(x) = x + |x|$

b) $F(x) = (x-2)^2 + 1$

c) $F(x) = x|x|$

d) $F(x) = |x-1|$

e) $F(x) = |x| + 1$

f) $f(x) = |x + 2|$

g) $F(x) = (x-3)^2$

h) $f(x) = x^2 + 4$

3) Find the S.S of the following :-

a- $|3x-4| < 5$

b- $|x-2| = 3x - 2$

c- $|2x+1| \leq 7$

d- $|x+2| \leq 0$

e- $|x+1| = 3x - 9$

f- $|3x - 2| = x$

4) Determine the type of each of the following functions:-

a- $F(x) = \sqrt{x^4 + x^2 - 5}$

b- $F(x) = \frac{x}{\cos x}$

C- $F(x) = \left(\frac{x^2}{3} - \frac{5}{x^4}\right)^5$

d- $F(x) = \frac{3x^2 - \cos x}{x^3 - 6x}$

e- $F(x) = \sin x^2 - \sin^2 x$

f- $F(x) = x \sin x^3$

5)

a- Graph the function:-

$$F(x) = \begin{cases} 2x & 0 \leq X < 2 \\ 8 - 2X & 2 < X \leq 4 \end{cases}$$

b- Find the range of the function then:

Deduce its monotoncity

Answers Algebra

Complete:-

1- R

2- Other wise

3- $]-\infty, 0\ ]$

4- $[-3\ , \infty[$

5- $[-4,4\ ]$

6- R - $[-1\ , 3\ ]$

7- (- 42)

8- R – $\{8\ \}$

9- $\{5\}$

10- $]-\infty, 1\ ]$

11- 2

12- $\{0\}$

13- $\{2,4\ \}$

14- $(-3\ , -3\ )$

15- $[0, \infty[$

16- X= -2

Math

Calculus

1) Complete:-

1- $\lim_{x \to 2} \frac{x^{-1} - 2^{-1}}{x^{-4} - 2^{-4}}$ = ...

2- $\lim_{x \to 2} \frac{3x+4}{\sqrt{2x} - 1}$ = ...

3- $\lim_{x \to 2} \frac{2x^3 - 16}{x-2}$ = ...

4- $\lim_{x \to 2} \frac{2x^2 - 5x + 2}{x-2}$ = ...

5- $\lim_{x \to 0} \frac{(x+2)^2 - 4}{x}$ = ...

6- $\lim_{x \to 1} \frac{x^8 - 1}{x^4 - 1}$ = ...

7- $\lim_{x \to 7} \frac{x^3 - 343}{x^2 - 49}$ = ...

8- $\lim_{x \to 3} \frac{x^2 - 1}{x-3}$ = ...

9- $\lim_{x \to a} \frac{x^5 - a^5}{x-a}$ = ...

10 - $\lim_{x \to 0} \sqrt{4 - x^2}$ = ...

11- $\lim_{x \to -1} \frac{x^5 + 1}{x+1}$ = ...

12- $\lim_{x \to 2} 10$ = ...

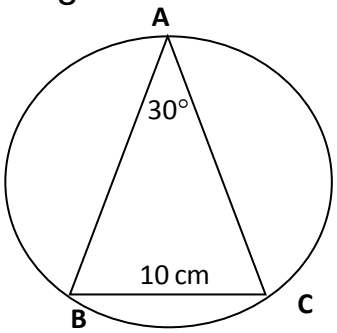
13- In any Triangle ABC: if $\frac{a}{\sin A}$ = 10 then the radius of the circum circle of this triangle = ...cm.

14- In Δ XYZ, 2r sin X = ...

15- In Δ ABC, If m ($\angle$ A) = 80° , m ($\angle$ B) = 60° , and c= 12 cm Then a = ...

16- In Δ ABC 2 sin A = 3 sin B = 4 sin C then a: b: c = ……

17- In the opposite figure BC = 10 cm then the diameter length of the circle = …… cm.



18- An equilateral Δ of side length 10 cm, then the length of the radius of its circum circle = …… cm.

19- In Δ ABC, ($\angle$ B) = 30° b= $\frac{5}{\pi}$ cm

The perimeter of cirlum circle = …… cm.

2) <u>Find the result of of the following:-</u>

1- $\lim_{x \to 1} \frac{x^2+6x-7}{x^2-1}$

2- $\lim_{x \to 0} \frac{(x+2)^3-8}{3x}$

3- $\lim_{x \to 3} \frac{3x^2-27}{x^2-x-6}$

4- $\lim_{2x \to -1} \frac{32\,x^5-1}{64x^6-1}$

5- $\lim_{x \to -1} \frac{(2x+1)^2-1}{x-1}$

6- $\lim_{x \to -2} \frac{2x^5+64}{x+2}$

7- $\lim_{x \to 1} \frac{\sqrt{x+1}-2}{x-1}$

8- $\lim_{x \to 2} \frac{x^7-128}{x^2+3x-10}$

9- $\lim_{x \to 2} \frac{2x^6-128}{x^2-4}$

10- $\lim_{x \to 5} \frac{x-5}{\sqrt{3x+1}-4}$

11- $\lim_{x \to -2} \frac{x^3+8}{x^5+32}$

12- In Δ ABC a= 8cm, b= 7 cm and m ($\angle$ c) = 48 °

I- The length of $\overline{AB}$

II- The radius length of the circum circle of Δ ABC.

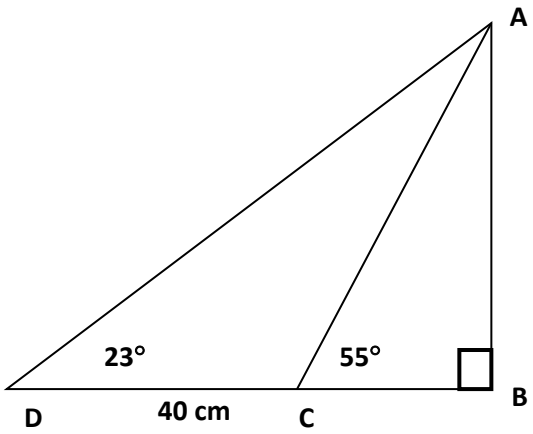
13- In Δ ABC, if a = 17.2, m ($\angle$ B) = 47 ° , m ($\angle$ c) = 73°

Find the perimeter of the triangle.

14 – m($\angle$ ADC) = 23°

m ($\angle$ A CB) = 55° and DC = 40cm

Find the length of each of: $\overline{AC}$ and $\overline{AB}$



3] Infinity

1) $\lim_{x\to\infty} \frac{3x^4-x+2}{5x^4-2}$

2) $\lim_{x\to\infty} \frac{2x^5-x^3+2x}{7x^4-1}$

3) $\lim_{x\to\infty} \frac{x^2+3x+2}{x^4-2}$

4) $\lim_{x\to\infty} \frac{(3x^4-x)(x+2)}{7x^5-2}$

5) $\lim_{x\to\infty} \frac{5x+2}{\sqrt{x^2-2}}$

6) $\lim_{x\to\infty} \frac{\sqrt[4]{x^4-x+2}}{\sqrt[3]{8x^3-2}}$

7) $\lim_{x\to\infty} \frac{x\sqrt{x}+x-\sqrt{x^2-3}}{x+\sqrt{x^3+1}}$

8) $\lim_{x\to\infty} \frac{12^{\frac{1}{x}}}{x}$

9) $\lim_{x\to\infty} \frac{3x^{-2}-x^{-3}+2}{5x^{-2}+x^{-4}-1}$

10) $\lim_{x\to\infty} \frac{2x^{-1}-x^{-2}+2}{3x^{-1}-7}$

11) $\lim_{x\to\infty} \frac{9^{\frac{1}{3}}}{x}$

12) $\lim_{x\to\infty} \frac{(3x^5-1)^2(x^7+2)}{7(x-3)^5(x^2-2)^6}$

Math

Answers

1) Complete:-

1) $\frac{-1}{-4}$ X 2^{-1+4} = 2
2) 10
3) 24
4) 3
5) 4
6) 2
7) $\frac{21}{2}$
8) undefined
9) $5a^4$
10) 2
11) 5
12) 10
13) 5
14) χ
15) $\frac{12 \sin 80}{\sin 40}$
16) 6 : 4 : 3
17) diameter = 20cm
18) $\frac{10}{\sqrt{3}}$
19) 10cm

2) Find the result of the following:

1) 4

2) 4

3) $\frac{18}{5}$

4) $\frac{-5}{6}$

5) 0

6) 80

7) The functions no limt [$\frac{\sqrt{2}-2}{0}$]

8) 64

9) 48

10) $\frac{8}{3}$

11) $\frac{3}{20}$

12) a) C = 6.17 cm.

b) r = 4.15 cm.

13) b = 14.53 cm.

c = 18.99 cm.

per = 50.72 cm.

14) AC = 29.49 cm.

AB = 24.16 cm.

3) Infinity

1) $\left(\frac{3}{5}\right)$

2) (∞)

3) (0)

4) $\left(\frac{3}{7}\right)$

5) 5

6) $\left(\frac{1}{2}\right)$

7) 1

8) (0)

9) (-2)

10) $\left(\frac{2}{-7}\right)$

11) (0)

12) $\left(\frac{3}{7}\right)$

Mechanics

1- Two forces are of magnitudes 5 and 10 newton act at a point and the measure of the included angle is 60°. Find the magnitude of their resultant and the measure of the angle which it makes with the first force. ($5\sqrt{7}$ newton , 40° 53' 36")

2- Two force of magnitude 30 and 16N. act at a particle. If the magnitude of their resultant is 26 N. Find the measure of the angle between the forces. (120°)

3- Find the magnitude and the direction of the resultant of two forces of magnitude 90 and 90 dyne if the measure of the included angle is 60°

($90\sqrt{3}$ dyne , $\theta = 30°$)

4- Two forces 2 , F newton , the angle between them is of measure 120°. Find F in each of the following cases:

1) The resultant = F

2) The resultant perpendicular to the 2nd force.

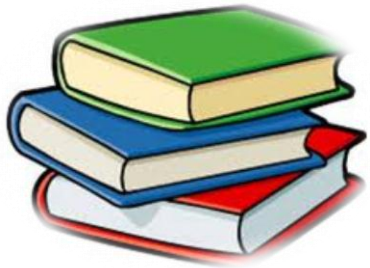
3) The resultant inclines by 45° to the 2nd force.

4) The resultant bisects the angle between the forces. **(2 , 1 , $\sqrt{3}$ + 1 , 2 newton)**

5- Two concurrent force of magnitudes F_1 , F_2 N. , the magnitude of their resultant is R newton where $4 \leq R \leq 16$ and $F_1 > F_2$, Find:

1) The magnitude of each of F_1 , F_2

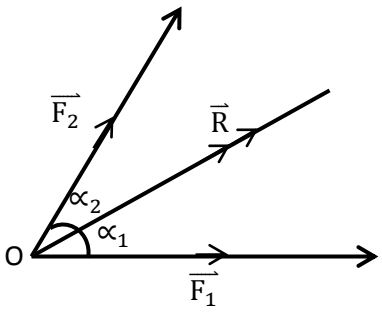
2) The magnitude of R if $\theta = 60°$ (F_1 = 10N , F_2 = 6N. , R = 14 N)



6- Five coplanar forces of magnitudes 7 , $4\sqrt{3}$, 8 , 6 and $9\sqrt{3}$ Kg. wt. act at a point in the directions of East , 30° North of East , 60°North of West of South and south respectively. Determine the magnitude and the direction of the resultant of these force. (12 kg. wt. , 60° South of East)

7- The forces 8 , $4\sqrt{3}$, $6\sqrt{3}$ and 14 newton act at a point , the measure of the angle between the first force and the second force is 30° , between the second and the third is 120° and between the third and the fourth id 90°. Find the magnitude and direction of the resultant of the resultant of these forces. (4 newton , 240°)

1) As resolving the force $\overrightarrow{R}$ into two forces $\overrightarrow{F_1}$ and $\overrightarrow{F_2}$ making with $\overrightarrow{R}$ two angles of measures $\propto_1$ and $\propto_2$, then $F_1 = \frac{\ldots\ldots}{\ldots\ldots}$, $F_2 = \frac{\ldots\ldots}{\ldots\ldots}$



Answers Mechanics

Solution:

1) $5\sqrt{7}$ newton , 40° 53' 36"

2) " 120° "

3) $90\sqrt{3}$ dune , $\theta = 30°$

4) 2 , 1 , $\sqrt{3}+1$, 2 Newton

5) F_1 = 10N , F_2 = 6N , R = 14N

6) 12Kg. wt. , 60° South of East

7) 4 Newton , 240°

8) $F_1 = \frac{sin \propto_2 x\, R}{\sin(\propto_1+\propto_2)}$, $F_2 = \frac{\sin\propto_1 x\, R}{\sin(\propto_1+\propto_2)}$