ADETOKUNBO PRECIOUS ADEMIDE

19/MHS11/015

PHARMACY

MATHS 102

For what values of x is the function y=1/(x-2) defined? State the domain and codomain

1. Y= 1

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 (x—2)

 If x=2 , 2-2=0 then it is undefined which would not make the domain to be a set of real numbers. It is defined for all real numbers except x=2. It is defined for all real numbers except x=0.

1. If k=ln V differentiate K

 dK = 1

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 dx V

1. Express Y as an explicit function of X in the following
2. 2x-3y-2=0

 Differentiate term by term with respect to x

 d (2x) – d (3y) – d (2) = 0

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 dx dx dx

 = 2 + 3 (dy/dx) – 0 = 0

 = 2+ 3 (dy/dx) = 0

 = 3(dy/dx) = 2

 dy = 2

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 dx 3

1. X2 + y2 = 4

= 2x + 2y (dy/dx) = 0

 = 2y (dy/dx) = -2x

 = dy = -2x

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 dx 2y

1. If P=sin-1t, find the derivative of P

P = x/sint

 X=sint

 Differentiating both sides

 = dx∕dp = cos t

 = but we want dy/dx therefore

 = dp∕dx = ⅟ cos t

 = Recall: cos2y + sin2y = 1

 = Cos2y = 1-sin2y

 = Cos y=√1-sin2y

 = But sint = P = sint2t = P2

 = Cost = √1-P2

 Hence :

 dp = 1 = 1

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 dx cost √1-p2

1. If f(x) = 2x2-5 and g(x) = 4x-2, find fog(x) and gof(x)
2. Fog(x) = 2x2 -5

 = 2(4x-2)2-5

 = 2(16x2-16x+4)-5

 = 32x2-32x+8-5

 = 32x2-32x+3

1. Gof(x) = 4x-2

 = 4(2x2-5) – 2

 = 8x2-20-2

 = 8x2-22

1. If f(X)=3x2-2x+1=0 show that fe(X)+ f0(X)=f(X)

Fe(x) = f(X) + f(X)

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 2

= f(-X) = 3 (-X)2 -2(-X) + 1

 = 3x2 + 2X + 1

= 3x2 – 2x + 1 + 3x2 + 2x + 1

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 2

= 6x2 + 2

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 2

= 2(3x2 + 1)

 -------------

 2

= 3x2 + 1

Fo = f((X) – f(X)

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 2

= (3x­2 – 2x + 1) – (3x2 + 2x + 1)

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 2

= 3x2 – 2x + 1 – 3x2 -2x -1

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 2

= -4x

 -------- = -2x

 2

= f(X) = fe(X) + f0(X)

= f(X)= 3x2 + 1 – 2x

= 3x2 – 2x + 1

1. Differentiate y=cosx from first principle

Y=cosx

= y+ꙋy= cos(x+ꙋx)

= subtracting y from both sides

= ꙋy= cos(x+ꙋx)

But y= cos x

= ꙋy=cos(x+ꙋy)-cosx

= consider from trigonometry

Cos(A+B)=cosAcosB – sinAsinB

Cos(A-B)=cosACosB+ sinAsinB

Subtracting cos(A+B) from cos(A-B)

Cos(A+B) –Cos(A-B) = -2sinAsinB

Compare (A) and(B)

= let A+B = x+ꙋx-------- (1)

= A-B = x-----------(2)

Adding (1) and (2)

= 2A = 2x+ꙋx

=A=2x + ꙋx∕2

 Compare equation (1) and (2)

 = Cos(x+ꙋx) = -2sin{x+ꙋx/2} sin{ꙋx/2}

 = ꙋy= -2sin{x+ꙋx/2} sin{ꙋx/2}

 = ꙋy = -2sin{x+ꙋx/2} sin{ꙋx/2}

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 ꙋx ꙋx

 = ꙋy = -sin(x+ꙋx/2) sin(ꙋx/2)

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 ꙋx (ꙋx/2)

 lim sin(ꙋx/2)

 ꙋx+0 ----------- = 1

 (ꙋx+2)

 = -sin(x+0) – 1

 = -sin x

 Lim ꙋy = dy

 ꙋx—x -- --- = -sinx

 ꙋx dx

1. Find dy/dx if y =3t2 and x=⅟t2

Y = 3t2 dy/dt=6t

X=⅟t2 dy/dt=-2t-3

Dy/dx = 6t ÷ -2t-3

 = -12t-4

1. Find dy/dx if y = x2cos2xℓ4x

ln y= ln x2 + lncos2x + ln ℓ+4x

d/dx (ln y)=d/dx (ln x2) + d/dx (ln cos2x) + d/dx (ln ℓ4x)

 1(dy/dx) = 1 (2x) + 1 (-sin2x) + 1 (ℓ4x)

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 Y x2 cos2x ℓ4x

Dy = 2x - sin2x +1

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 Dx x2 cos2x

 = dy = x2cos2xℓ4x (2x2 – sin2x + 1)

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 dx (x cos2x )

1. Given that y = sin(3x3 + 5 ) find the derivative of y

 Let U= 3x3+ 5

 du/dx = 9x2

 y = sin U = dy/du = cos U

 dy = dy \* du

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 dx du dx

 = cosU \* 9x2

 = 9x2cos(3x3 + 5 )