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GSEB Std 12 Mathematics

Previous Year Questions (2016 - 2025)

Gujarat Board HSC Chapter-wise Compilation

Compiled by Monomath.com | Ajay Yadav (Math King of Katargam)
15+ Years Teaching Experience

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GSEB Std 12 (HSC) Mathematics PYQs from 2016-2025.

Chapter 1: Relations and Functions

Short Questions

Q1. If f(x)=x^3, find f^{-1}(8). [2020

Q2. If f(x)=2x+3, find f^{-1}(x). [2019

Q3. Check if R={(1,1),(2,2),(3,3)} on {1,2,3} is reflexive. [2022

Q4. Show f:R->R given by f(x)=x^3 is injective. [2020

Q5. Prove f:R->R given by f(x)=2x is one-one and onto. [2023

Q6. Show f(x)=4x+3 is invertible. Find f^{-1}. [2019

Q7. Prove f:N->N given by f(x)=2x is one-one but not onto. [2024

Chapter 2: Inverse Trigonometric Functions

Short Questions

Q1. Find principal value of sin^{-1}(1/2). [2020]

Q2. Find principal value of tan^{-1}(sqrt3). [2019]

Q3. Find principal of cos^{-1}(-sqrt3/2). [2018]

Q4. Find tan^{-1}(1)+cos^{-1}(-1/2)+sin^{-1}(-1/2). [2019]

Q5. Prove tan^{-1}(1/2)+tan^{-1}(1/3)=pi/4. [2023]

Q6. Prove 2tan^{-1}(1/3)+tan^{-1}(1/7)=pi/4. [2022]

Q7. Solve tan^{-1}(2x)+tan^{-1}(3x)=pi/4. [2019]

Q8. Prove 2tan^{-1}(1/5)+tan^{-1}(1/7)+2tan^{-1}(1/8)=pi/4. [2024]

Chapter 3: Matrices

Short Questions

Q1. If A=[aij] is 2x3 with aij=i+j, find A. [2020]

Q2. Find x for which [[4,4],[x,1]] singular. [2018]

Q3. If A=[[3,1],[-1,2]], show A^2-5A+7I=0. [2020]

Q4. If A=[[1,2],[2,1]], show A^2-2A-3I=0. [2019]

Q5. Express [[3,3,-1],[-2,-2,1],[-4,-5,2]] as sum of symmetric and skew-symmetric. [2024]

Q6. If A=[[2,0,1],[2,1,3],[1,-1,0]], find A^2-5A+4I and A^{-1}. [2017]

Chapter 4: Determinants

Short Questions

Q1. Evaluate determinant of [[2,3],[4,5]]. [2019]

Q2. If |A|=5 for 3x3, find |adj A|. [2018]

Q3. Find x: |[[x,2],[3,4]]|=2. [2022]

Q4. If A=[[1,2],[3,4]], find A^{-1} by adjoint. [2019]

Q5. Prove: |[[1,1,1],[a,b,c],[a^3,b^3,c^3]]|=(a-b)(b-c)(c-a)(a+b+c). [2022]

Q6. Solve system: 3x+4y+5z=18, 2x-y+8z=13, 5x-2y+7z=20 using matrix method. [2017]

Chapter 5: Continuity & Differentiability

Short Questions

Q1. Check continuity of f(x)=|x| at x=0. [2020

Q2. Find dy/dx if y=log(sin x). [2019

Q3. Find dy/dx if y=(log x)^{sin x}. [2020

Q4. Find dy/dx if x=a sec t, y=b tan t. [2023

Q5. If y=(tan^{-1}x)^2, show (1+x^2)^2 y2+2x(1+x^2)y1=2. [2022

Q6. Differentiate x^{sin x}+(sin x)^{cos x} w.r.t. x. [2019

Q7. If y=e^{m cos^{-1}x}, prove (1-x^2)y2-xy1-m^2y=0. [2024

Chapter 6: Application of Derivatives

Short Questions

Q1. Find rate of change of area of circle w.r.t. radius r when r=3. [2020

Q2. Find slope of tangent to y=x^3-x+1 at x=1. [2019

Q3. Find intervals where f(x)=2x^3-15x^2+36x+1 increasing. [2020

Q4. Find max and min of f(x)=sin x+cos x on [0,2pi]. [2019

Q5. Find maximum area isosceles triangle inscribed in circle of radius a. [2020

Q6. Find rectangle of max area inscribed in circle of radius R. [2024

Chapter 7: Integration

Short Questions

Q1. Evaluate int x^2 dx. [2020]

Q2. Evaluate int sin x dx. [2019]

Q3. Evaluate int x sin x dx. [2020]

Q4. Evaluate int x e^x dx. [2018]

Q5. Evaluate int x^2 log x dx. [2022]

Q6. Evaluate int 0 to pi/2 sqrt(sin x)/[sqrt(sin x)+sqrt(cos x)] dx. [2018]

Q7. Evaluate int 0 to 1 x log(1+2x) dx. [2024]

Q8. Evaluate int 0 to pi (x sin x)/(1+cos^2 x) dx. [2017]

Chapter 8: Differential Equations

Short Questions

Q1. Find order and degree of (d^2y/dx^2)^3+(dy/dx)^2+sin(dy/dx)=0. [2020

Q2. Solve: dy/dx+y=e^{-x}. [2020

Q3. Solve: (1+x^2)dy/dx+2xy=cos x. [2023

Q4. Solve: dy/dx+2y tan x=sin x, y=0 at x=pi/3. [2022

Q5. Solve: (x^3+y^3)dx-xy^2dy=0. [2020

Q6. Solve:(x^2-y^2)dx+2xydy=0, y=1 at x=1. [2024

Chapter 9: Vector Algebra

Short Questions

Q1. Find magnitude of vector 2i+3j-6k. [2020

Q2. Find unit vector in direction of i+2j+2k. [2019

Q3. If |a|=2,|b|=3 and a.b=0, find |axb|. [2018

Q4. Find projection of a=2i+3j-k on b=i+2j-3k. [2020

Q5. If a=2i-j+k, b=i+2j-3k, find axb. [2023

Q6. If |a+b|=|a-b|, prove a and b are perpendicular. [2020

Q7. Prove parallelogram law: |a+b|^2+|a-b|^2=2(|a|^2+|b|^2). [2024

Chapter 10: 3D Geometry

Short Questions

Q1. Find direction ratios of line joining (2,3,-1) and (4,5,2). [2020

Q2. Find distance of (1,2,3) from plane x+y+z=6. [2022

Q3. Find plane through (1,2,3) parallel to x+y+z=5. [2020

Q4. Find foot of perpendicular from (2,3,4) to line (x-1)/2=(y-2)/3=(z-3)/4. [2019

Q5. Find distance of (3,4,5) from plane 2x+y-z=5 parallel to x/2=y/3=z/-1. [2017

Chapter 11: Linear Programming

Short Questions

Q1. Define feasible region in LPP. [2020

Q2. Draw feasible for x+y<=4, x>=0, y>=0. [2019

Q3. Maximize Z=3x+2y: x+2y<=10, 3x+y<=15, x,y>=0. [2020

Q4. Minimize Z=3x+5y: x+3y>=3, x+y>=2, x,y>=0. [2019

Q5. Minimize Z=5x+10y: x+2y<=120, x+y>=60, x-2y>=0, x,y>=0. [2017

Chapter 12: Probability

Short Questions

Q1. If P(A)=0.4,P(B)=0.5,P(AB)=0.2, find P(A|B). [2020

Q2. If P(A)=0.5,P(B)=0.4,P(AUB)=0.7, find P(A|B). [2018

Q3. Probability of 2 red balls from bag with 3 red, 5 black without replacement. [2020

Q4. If A,B independent, prove A',B' independent. [2023

Q5. Three machines X,Y,Z produce 60%,30%,10%. Defective 2%,3%,4%. Find P(drawn from X|defective). [2024