



MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE SCANNER (TEXTUAL BITS)



1. Determine x so that 2 is the slope of the line

through P (2 , 5) and Q (x , 3) . (AS_1)

2. Find the value of y, if the line joining (3,y) and (2,7) is parallel to the line joining the points (-1,4) and (0,6).



3. Find the condition for the points (a,0),(h,k) and

(0,b) when $\neq 0$ to be collinear.



4. Find the equation of the straight line passing through (-4, 5) and cutting off equal intercepts on the coordinate axes.

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5. Find the equationof the straight line passing through the point (-2,4) and making intercepts, whose sum is zero

6. Transform the equation 2x - 3y + 6 = 0 into Normal form Watch Video Solution

7. Find the value of a it the area of the triangle

formed by the liners x=0,y=0,3x+4y=a is 6 sq units.

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8. Find the distance between the parallel to the lines

5x-3y-4=0,10x-6y-9=0





9. Find the equation of the straight line parallel to the lines 2x + 3y + 7 = 0 and passing through the point (5,4).

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10. Find the value of p if the equation of the straight

lines x+p=0,y+2=0,3x+2y+5=0 are concurrent.

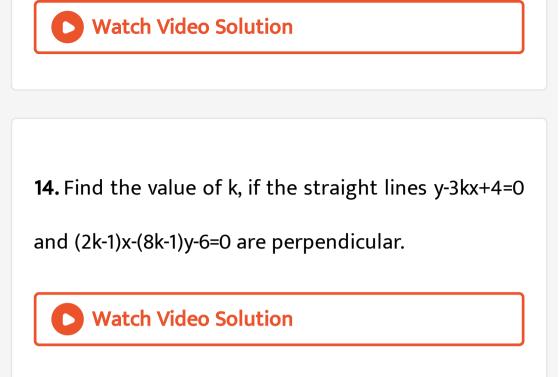
11. Find the distance,between the parallel lines
3x+4y-3=0,6x+8y-1=0.
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12. Find the value of p,if the straight lines 6x-

10y+3=0,kx-5y+8=0 are parellel.

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13. Find the value of p, if the straight lines 3x + 7y - 1 = 0 and 7x - py + 3 = 0 are mutually perpendicular.



15. Find the equation of the straight line passing through A(-1,3) and (i) parallel (ii) perpendicular to the straight line passing through B(2,-5),C(4,6)



16. Find the equation of the line passing through the

points (1,-1) and (2,3).

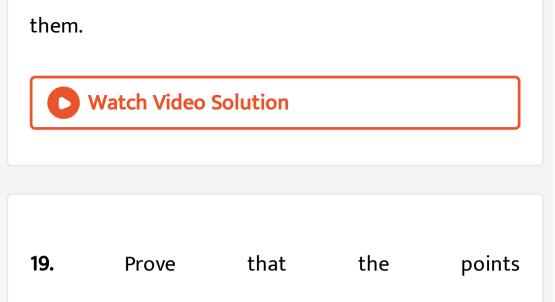


17. Find the equation of the straight line perpendicular to the line 5x-3y+1=0 and passing through the point (4,-3).

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18. Prove that the point (1,11),(2,15),(-3,-5) are collinear

and find the equation of the straight line containing



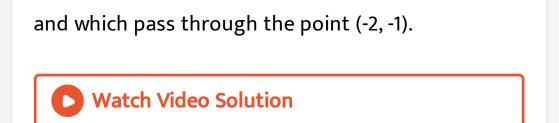
(a, b + c), (b, c + a) and (c, a + b) are collinear

and find the equation of the straight line containing

them.



20. Find the equation of the straight line, which make $150^{\,\circ}$ with the X-axis in the positive direction



21. Find the equation of the straight line, which make 135° with the X-axis in the positive direction and which pass through the point (3,-2).



22. Find the equation of the straight line, which make $\pi/4$ with the X-axis. y = x in the positive direction and which pass through the point (0,0)

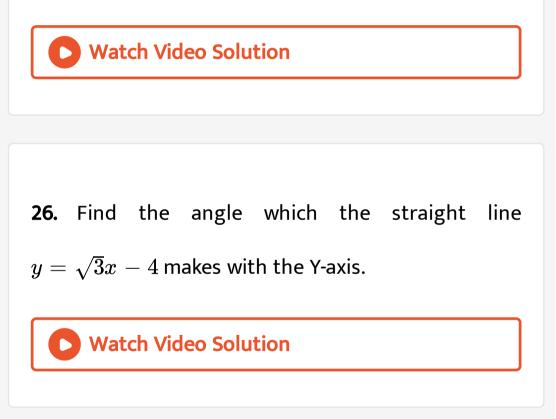


23. The angle made by a straight line with the positive X-axis in the positive direction is 150° and Y-intercept cut off by it is 2. Find the equation of the line.

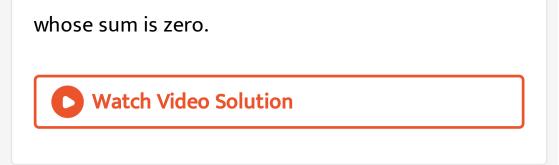
24. Find the equation of the straight line with inclination $heta= an^{-1}\left(rac{2}{3}
ight)$ and y-intercept 3.

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25. Find the angle made by the straight line $y = -\sqrt{3}x + 3$ with the positive direction of the X-axis measured in the counter-clock wise direction.



27. Find the equation of the straight line passing through the point (2,3) and making intercepts,

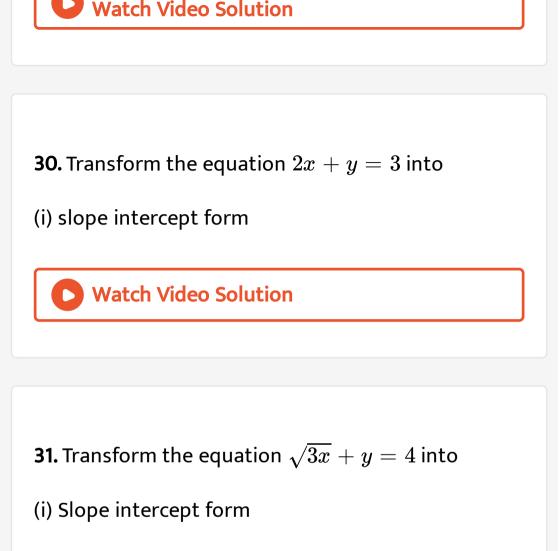


28. Find the equation of the straight line passing through the ponts (3, -4) and making X and Y-intercepts which are in the ratio 2:3



29. Find the equation of the straight line passing through the origin and making equal angles with the co-ordinate axes.





(ii) Intercept form

32. Transform the equation $\sqrt{3}x+y=4$ into

Normal form



33. Transform the equation x + y + 1 = 0 into (i)

slope intercept form

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34. Transform the equation x + y + 1 = 0 into (ii)

intercept form



35. Transform the equation of x + y + 1 = 0 into

Normal form

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36. Transform the equation 3x + 4y + 12 = 0 into

(i) intercept form



37. Transform the equation of x+y+1=0 into

Normal form



38. Transformation the equation 4x - 3y + 12 = 0

into (i) slope intercept form (ii) intercept form



39. Transform the equation 4x + 3y - 12 = 0 into

intercept form.



40. Find the sum of the square of the intercepts of

the line 4x - 3y = 12 on the axes of co-ordinates.



41. If the product of the intercepts made by the straight line $x \tan \alpha + y \sec \alpha = 1$, $\left(0 \le \alpha \le \frac{\pi}{2} \right)$,

on the co-ordinates axes is equal to $\sin \alpha$, find α .

42. A straight line passing through A(-2, 1), makes an angle of 30° with the positive direction of the X-axis. Find the points on the straight line whose distance from A is 4 units.

0

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43. A straight line passing through A(1, -2) makes an angle $\frac{\tan^{-1}4}{3}$ with the positive direction of the X-axis in the anticlock wise sense. Find the point on the straight line whose distance from A is 5 units.



44. Find the area of the triangle formed by the line

3x - 4y + 12 = 0 with the coordinate axes.



45. Find the ratio in which the straight line 5x - 6y - 21 = 0 divides the line joining the points (4, -1) and (2, 1)



46. Find the ratio in which (i) the X -axis.

-



47. Find the ratio in which (ii) the Y-axis divide the line segment AB joining the points A (2, -3) and B(3, -6).

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48. Find the ratio in which the straight line 2x + 3y - 5 = 0 divides the line joining the points (0,0) and (-2,1).



49. Find the ratio in which the straight line 5x - 6y - 21 = 0 divides the line joining the points (4, -1) and (2, 1)

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50. State whether the points A(3, 2), B(-4, -3)lie on the same side or opposite sides of the line 2x - 3y + 4 = 0.

51. State whether the points A(2, -1), B(1, 1) lie on the same or opposite sides of the line 3x + 4y = 6.

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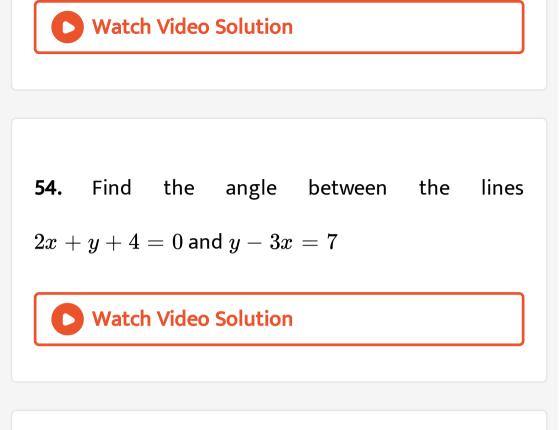
52. Find the point of concurrence of the set of lines

$$(2+5k)x - 3(1+2k)y + (2-k) = 0$$

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53. Find the point of concurrence of the set of lines

$$(k+1)x + (k+2)y + 5 = 0$$



55. Find the angle between the lines

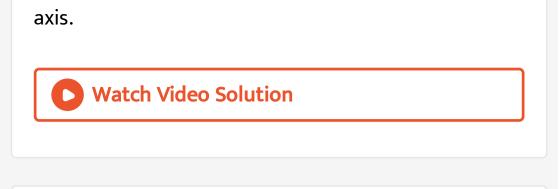
ax+by=a+b, a(x-y)+b(x+y)=2b

56. Find the angle between the lines
$$y = -\sqrt{3}x + 5, y = \frac{1}{\sqrt{3}}x - \frac{2}{\sqrt{3}}$$
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57. Find the equation of the straight line passing through the points $(at_1^2, 2at_1), (at_2^2, 2at_2).$

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58. Write the equations of the straight lines parallel to X-axis and (i) at a distance of 3 units above the X-



59. Write the equations of the straight lines parallel to X-axis and (i) at a distance of 4 units below the X-axis.



60. Write the equations of the straight lines parallel

to Y-axis and (i) at a distance of 2 units from the Y-

axis to the right of it.





61. Write the equations of the straight lines parallel to Y-axis and (i) at a distance of 5 units from the Y-axis to the left of it.

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62. If the portion of a straight line intercepted between the axes of co-ordinates is bisected at (2p, 2q), write the equation of the straight line.

63. The intercepts of a straight line on the axes of co-ordinates are a and b.

If p is the length of the perpendicular drawn from the origin to this line. Write the value of p in terms of a and b.

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64. Find the equation of the straight line whose distance from the origin is 4, if the normal ray form the origin to the straight line makes an angle of 135° with the positive direction of the X-axis.



65. A straight line whose inclination with the positive direction of the X-axis measured in the anticlockwise sense is $\pi/3$ makes positive intercept on the Y-axis. If the straight lie is at a distance of 4 from the origin, find its equation.



66. Find the equation of the straight line passing through the point of intersection of the lines x + y + 1 = 0 and 2x - y + 5 = 0 and containing the point (5, -2).



67. If a,b,c are arithmetic progression then show that the equation ax + by + c = 0 represents a family of concurrent lines and find the point of concurrency.

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68. If 3a + 2b + 4c = 0 then show that the equation

ax + by + c = 0 represents a family of concurrent

straight lines and find the point of concurrency.

69. Find the point of intersection of the straight

lines
$$rac{x}{a}+rac{y}{b}=1$$
 and $rac{x}{b}+rac{y}{a}=1, (a
eq \pm b)$

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70. Find the equation of the straight line passing through the points (-1, 2) and (5, -1) and also find the area of the triangle formed by it with the axes of coordinates.



71. Find the set of values of a if the points (1, 2) and (3, 4) lie to the same side of the straight line 3x - 5y + a = 0

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72. (-4, 5) is a vertex of a square and one of its diagonals is 7x - y + 8 = 0. Find the equation of a the other diagonal.



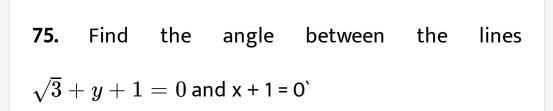
73. Find the incentre of the Δ^{le} with the vertices $(1, \sqrt{3}),(0,0)$ and (2,0)Watch Video Solution

74. Find the equation of the line perpendicular to

the line 3x + 4y + 6 = 0 and making intercept -4

on X-axis.







3 D Geometry

1. Find the coordinates of the vertex 'C' of ΔABC if its centroid is the origin and the vertices A,B are (1,1,1) are (-2,4,1) respectively.

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2. If (3,2,-1),(4,1,1) and (6,2,5) are three vertices and (4,2,2) is the centroid of a tetrahedro, find the fourth vertex to that tetrahedron.



3. Find the fourth vertex of the parallelogram whose

consecutive vertices are (2, 4, -1), (3, 6, -1) and (4, 5, 1).

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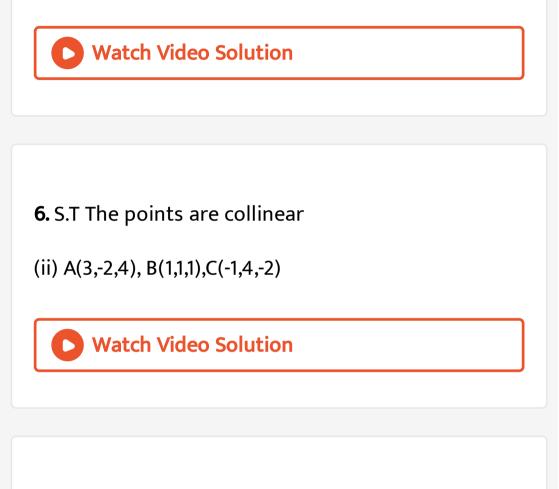
4. Find the ratio in which YZ-plane divides the line

joining A (2,4,5), B(3,5,-4).



5. S.T The points are collinear

(i) (1, 2, 3), (7, 0, 1), (-2, 3, 4)



7. Find distance between the points (5, -1, 7) and

(8,5,1)

8. Show that the points (1,2,3), (2,3,1) and (3,1,2) form

an equilateral triangle.

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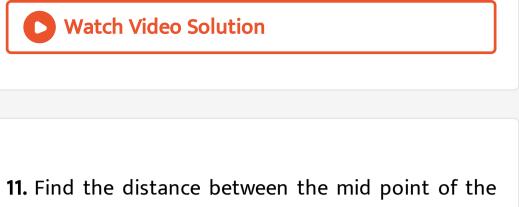
9. Show that the point `A(-4, 9, 6), B(-1,6,6), C(0,7,10)

form a right angled isosceles triangle.

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10. Show that ABCD is a square where A,B,C,D are the

points (0,4,1),(2,3,-1),(4,5,0) and (2,6,2) respectively.



line segment \overline{AB} and the point (3, -1, 2) where A = (6,3,-4), B = (-2,-1,2).

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12. If $M(\alpha, \beta, \gamma)$ is the mid point of the line segment joining the points $A(x_1, y_1, z_1)$ and B then find B.

13. If (x_1, y_1, z_1) and (x_2, y_2, z_2) are two vertices and (α, β, γ) is the centroid of a triangle, find the third vertex of the triangle.

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14. Find the ratio in which the XZ-plane divides the line joining A(-2,3,4) and B(1,2,3)



15. Show that the points (5,4,2),(6,2,-1) and(8,-2,-7)` are

collinear.



16. Show that the points A(3, 2, -4), B(5, 4, -6) and C(9, 8, -10) are

collinear and find the ratio in which B divides \overline{AC} .

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17. If H,G,S, I are respectively othercentre centroid , circumcentre and incentre of a triangle formed by the points (1,2,3), (2,3,1) and (3,1,2) . Then H + G + S + I

=

18. The incentre of the triangle formed by (0,0,0), (3,0,0),(0,4,0) is

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19. A,B,C are three points OX,OY,OZ respectively, at distance a,b,c from the origin 'O'. Find the coordinates of the point which is equidistant from A,B,C and 'O'.



20. P is a variable point which moves such that 3PA =2PB. If A(-2,2,3) and B=(13,-3,13) prove that P satisfies the equation.

 $x^2 + y^2 + z^2 + 28x - 12y + 10z - 247 = 0$

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21. Show that the point whose distance from Y-axis in thrice its distance from (1,2,-1) satisfies the equation

$$8x^2 + 9y^2 + 8z^2 - 18x - 36y + 18z + 54 = 0.$$



22. Find the centroid of triangle ABC where A (6,-2,7),

B(3,-6,10), C(6,2,1).

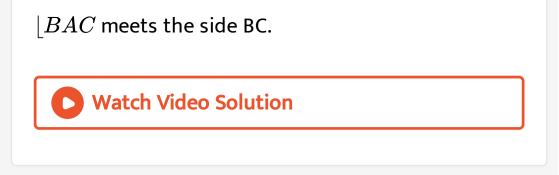


23. The centroid of the tetrahedron whose vertices are

 $(4,\,1,\,-2),\,(\,-3,\,3,\,-4),\,(\,-3,\,2,\,1),\,(4,\,2,\,3)$

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24. A(5,4,6), B(1,-1,3), C(4,3,2) are three points. Find the coordinates of the point in which the bisector of



25. If the origin is shifted to the point (1, 2) by a translation of the axes, find the new coordinates of the point (3,-4)



26. Find the ratio in which the point P(5,4,-6) divides the line segment joining the points A(3,2,-4) and B(9,8,-10). Also find the harmonic conjugate of P.





27. A line makes angles 90° , 60° , 30° with the positive direction of X,Y,Z axes respectively. Find its direction cosisnes.

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28. Find the direction cosines of the line joining the

points (-4,1,7),(2,-3,2)`

29. Find the dr's and dc'r of the line joining the points (4,-7,3),(6,-5,2). Watch Video Solution **30.** If the d.c's of a line are (1/c, 1/c, 1c) then find c. Watch Video Solution **31.** Find the angle between the lines whose direction ratios are $(1, 1, 2)(\sqrt{3}, -\sqrt{3}, 0)$

32. O is the origin , P(2,3,4), Q(1,k,1) are points such that $\overline{OP} \perp \overline{OQ}$ then find k.

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33. Show that the line joining the points A(2,3,-1) and B(3,5,-3) is perpendicular to the line joining C(1,2,3) and D(3, 5, 7).

34. For what value of x the line joining A(4,1,2), B(5,x,0) is perpendicular to the line joining C(1,2,3), D(3,5,7).

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35. If the line joining the points A(2,3, -1) and B(3, 5, -3) is perpendicular to the line joining C(1,y,3)and D(3, 5, 7), then y =

36. A ray makes angles $\pi/3, \pi/3$ with \overline{OX} and \overline{OY}

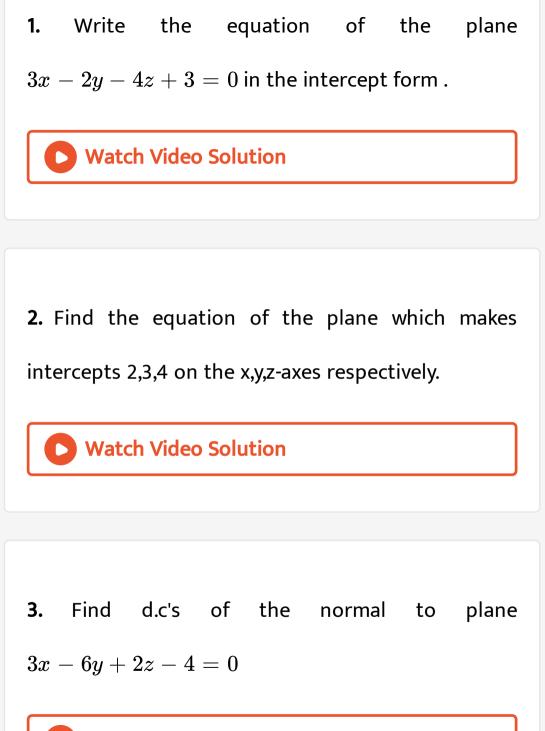
respectively. Find the angle made by it with \overline{OZ}



37. If α , β , γ are the angles made by a line with the positive directions of the coordinate axes, then $\sin^2 \alpha + \sin^2 \beta + \sin^2 \gamma =$







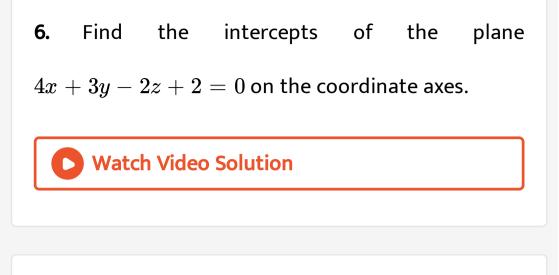
4. Find the equation of the plane passing through the point (1,1,1) and parallel to the plane x + 2y + 3z - 7 = 0

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5. Reduce the equation x + 2y - 3z - 6 = 0 of the

plane to the normal form.





7. Find the equation of the plane through the point

 $(lpha,eta,\gamma)$ and parallel to the planeax+by+cz=0

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8. Find the equation of the plane passing through the point (1,2,-3) and parallel to the plane

$$2x - 3y + 6z = 0$$

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9. Find the equation of the plane passing through the point (-2, 1, 3) and having `(3, -5, 4) as d.r's of its normal.



10. Find the equation of the plane through (-1,6,2)

are perpendicular to the join of (1,2,3) and (-2,3,4).



11. Find the equation of the plane If the foot of the

perpendicular from origin of the plane is A(1,3,-5)

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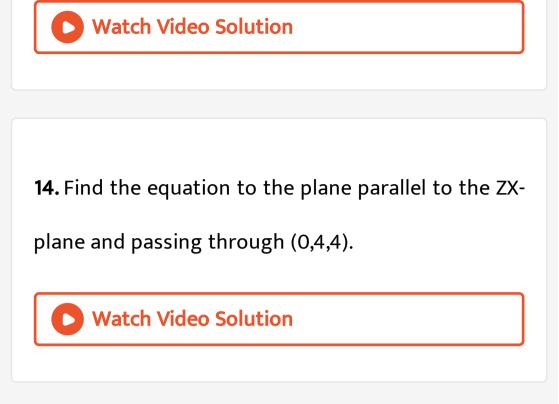
12. Find the equation of the plane If the foot of the

perpendicular from origin of the plane is A(2,3,-5).

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13. Find the equation of the plane passing through

the point (2,3,4) and perpendicular to the x-axis.



15. Find the angle between the planes 2x - y + z = 6

and x + y + 2z = 7.



16. Find the angle between the planes 2x - y + z = 6

and x + y + 2z = 7.



17. Find the constant k so that the planes x-2y+kz=0, 2x+5y-z=0 are at right angles.



18. Show that 2x + 3y + 7 = 0 represents a plane

perpendicular to xy-plane.



19. The equation of the plane bisecting the line segment joining the points (2,0,6) and (-6,2,4) and perpendicular to it is

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20. Show that the plane through (1,1,1),(1,-1,1) and

(-7,-3,-5) is parallel to the Y-axis.



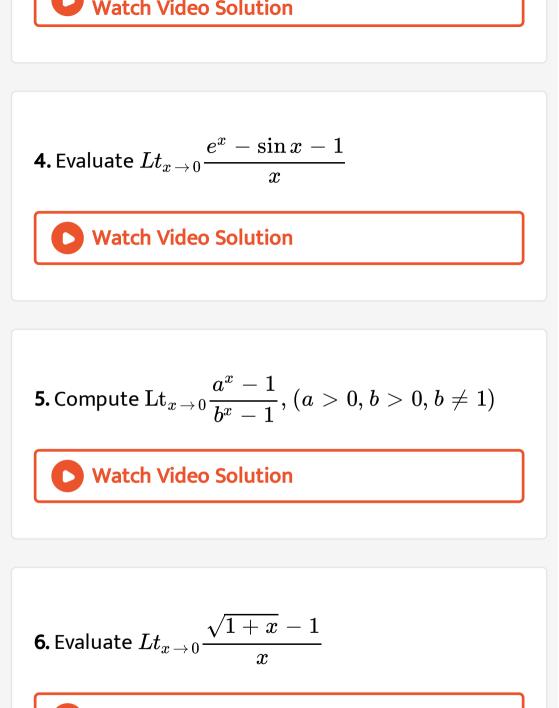
1. Evaluate the following limits.

$$Lt_{x\,
ightarrow\,2}rac{2x^2\,-\,7x\,-\,4}{(2x\,-\,1)ig(\sqrt{x}\,-\,2ig)}$$

2. Evaluate
$$\lim_{x o 0} \, rac{e^{7x}-1}{x}$$

3. Evaluate
$$Lt_{x
ightarrow 0} igg(rac{e^{3+x}-e^3}{x} igg)$$





7. Evaluate
$$Lt_{x
ightarrow 0} rac{e^x-1}{\sqrt{1+x}-1}$$

8. Evaluate
$$Lt_{x
ightarrow\infty}rac{11x^3-3x+4}{13x^3-5x^2-7}$$

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9. Evaluate
$$Lt_{x o \infty} \left(\sqrt{x^2 + x} - x
ight)$$

10. Compute
$$\lim_{x \to \infty} (\sqrt{x+1} - \sqrt{x})$$

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11. Evaluate $\lim_{x \to 0} \frac{1 - \cos 2mx}{\sin^2 nx}$
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12. Evaluate
$$Lt_{x o \pi/2} rac{\cos x}{\left(x - rac{\pi}{2}
ight)}$$

13. Compute
$$\lim_{x \to a} \frac{\tan(x-a)}{x^2-a^2} (a \neq 0).$$

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14. Evaluate $Lt_{x \to 1} \frac{\sin(x-1)}{x^2-1}$
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15. $\lim_{x \to 0} \frac{\cos ax - \cos bx}{x^2} =$
Watch Video Solution

16. Find
$$\displaystyle rac{{
m Lt}}{x
ightarrow 0} \displaystyle rac{\sin(a+bx)-\sin(a-bx)}{x}$$

17.
$$\mathop{
m Lt}\limits_{x
ightarrow\infty}rac{8|x|+3x}{3|x|-2x}.$$

0

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18. Show that
$$Lt_{x o 0+}\left(rac{2|x|}{x}+x+1
ight)=3.$$

19. Is f defined by $f(x)= egin{cases} rac{\sin 2x}{x} & ext{if} \ x
eq 0 \ 1 & ext{if} \ x=0 \end{cases}$

continuous at 0?

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20. Is f given by
$$f(x) = \begin{cases} rac{x^2-9}{x^2-2x-3} & ext{if } 0 < x < 5 ext{ and } x \neq 3 \ 1.5 & ext{if } x = 3 \end{cases}$$
 ,

continuous at the points 3.

21. Check the continity of the following function at 2

$$f(x) = \left\{egin{array}{ccc} rac{1}{2}ig(x^2-4ig) & ext{if} \;\; 0 < x < 2 \ 0 & ext{if} \;\; x = 2 \ 2 - 8x^{-3} & ext{if} \;\; x > 2 \end{array}
ight.$$

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22. Show that

$$f(x) = \begin{cases} \frac{\cos ax - \cos bx}{x^2} & \text{if } x \neq 0\\ \frac{1}{2}(b^2 - a^2) & \text{if } x = 0 \end{cases}$$
is continuous at 0
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23. Evaluate
$$Lt_{x
ightarrow 3} rac{x^4-81}{2x^2-5x-3}$$

1



24. Evaluate
$$Lt_{x
ightarrow 3}rac{x^3-3x^2}{x^2-5x+6}$$

25. Compute the limit of
$$Lt_{x
ightarrow 3}rac{x^2-8x+15}{x^2-9}$$

26. Lt
$$_{x
ightarrow 1} rac{(2x-3)ig(\sqrt{x}-1ig)}{2x^2+x-3} =$$

27. Evaluate
$$Lt_{x \to 1} \frac{(1+x)^{3/2} - 1}{x}$$

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28. Evaluate $Lt_{x \to 0} \frac{\sqrt[3]{1+x} - \sqrt[3]{1-x}}{x}$
Watch Video Solution

29. Evaluate
$$Lt_{x
ightarrow 0}rac{\left(1+x
ight)^{1/8}-\left(1-x
ight)^{1/8}}{x}$$

30. Show that
$$Lt_{x
ightarrow 0} rac{e^x - 1}{x} = 1$$

31. Evaluate
$$Lt_{x
ightarrow 3}rac{e^x-e^3}{x-3}$$

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32. Evaluate
$$Lt_{x
ightarrow 0}rac{e^{\sin x}-1}{x-3}$$

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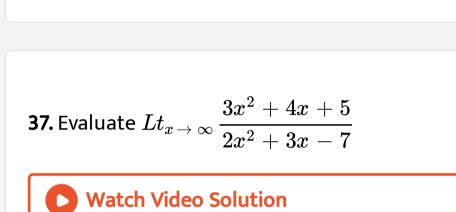
33. Evaluate
$$Lt_{x
ightarrow 1} rac{\log_e x}{x-1}$$



34. Evaluate
$$Lt_{x
ightarrow 0} rac{\log(1+5x)}{x}$$

35. Evaluate
$$Lt_{x
ightarrow 0} rac{3^x-1}{\sqrt{1+x}-1}$$

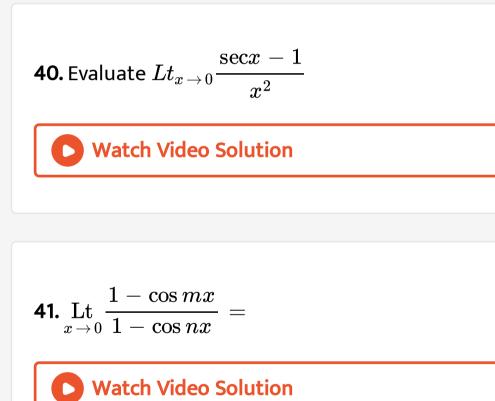
36. Evaluate
$$Lt_{x
ightarrow 3}rac{x^2+3x+2}{x^2-6x+9}$$



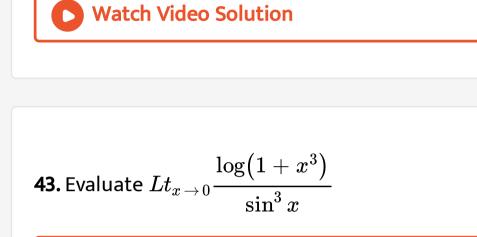
38. Compute
$$\lim_{x
ightarrow\infty} \ rac{x^2+5x+2}{2x^2-5x+1}$$

39. Lt
$$_{x \rightarrow 0} rac{1 - \cos x}{x} =$$





42. Evaluate
$$Lt_{x o 0} rac{x(e^x-1)}{1-\cos x}$$



44. Evaluate
$$rac{ ext{Lt}}{x o 2} \left\{ rac{1}{x-2} - rac{4}{x^2-4}
ight\}$$

45. If f is given by $f(x) = egin{cases} k^2x-k & ext{if} \ x \geq 1 \\ 2 & ext{if} \ x < 1 \end{bmatrix}$ is a

continuous function on R, then find k.

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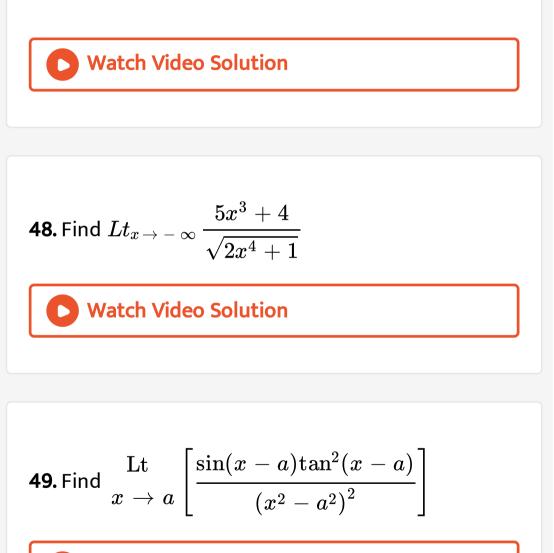
46. Find whether the limit of f(x) exists or not at x =

3, where

$$f(x) = egin{cases} x+2 & ext{ if } -1 < x \leq 3 \ x^2 & ext{ if } 3 < x < 5 \end{cases}$$

47. If
$$f(x) = rac{|x|}{x}$$
 then show that $Lt_{x
ightarrow 0}$ f(x) does

not exist.



50. Find
$$Lt_{x
ightarrow a} \left[rac{\sqrt{a+2x}-\sqrt{3x}}{\sqrt{3a+x}-2\sqrt{x}}
ight]$$

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51. Find
$$Lt_{x
ightarrow a} igg(rac{x \sin a - a \sin x}{x - a} igg)$$

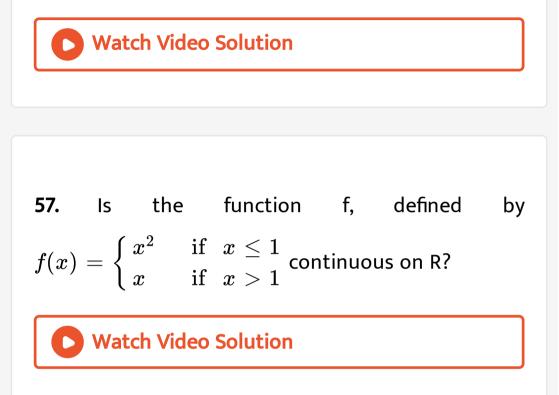
52. Evaluate
$$Lt_{x
ightarrow 0}rac{x \tan 2x - 2x \tan x}{\left(1 - \cos 2x
ight)^2}$$

53. Evaluate
$$Lt_{x
ightarrow\infty} rac{x^2-\sin x}{x^2-2}$$

54. Compute
$$Lt_{x \rightarrow 3} \frac{x^2 - 9}{x^3 - 6x^2 + 9x + 1}$$
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55. Compute
$$Lt_{x
ightarrow 0} rac{\sin ax}{\sin bx}, \, b
eq 0, \, a
eq b$$

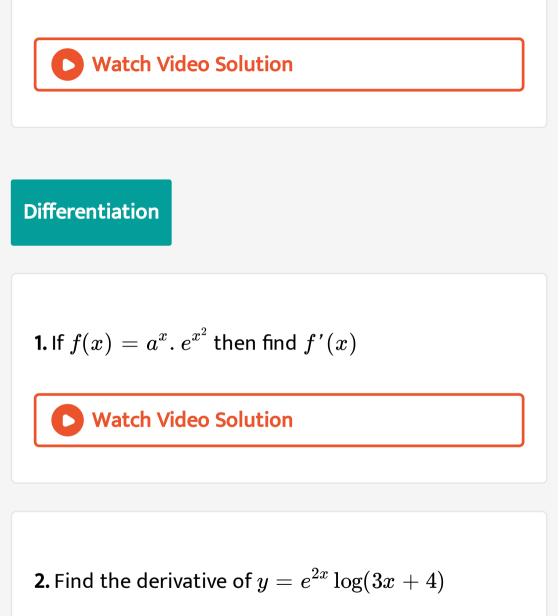
56. Evaluate
$$Lt_{x
ightarrow 0} rac{\log(1+5x)}{x}$$

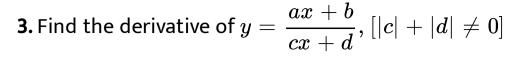


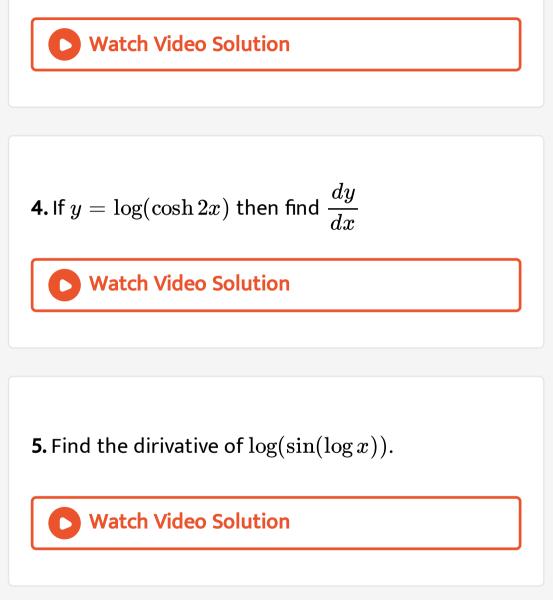
58. Show that f(x) = sinx is continuous on R.



59. Define a continuous function at a point.







6. Find
$$\frac{d}{dx} (\sec \sqrt{\tan x})$$
.

7. If
$$y = \sin^{-1} \sqrt{x}$$
, then find $\frac{dy}{dx}$.

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8. Find the derivative of
$$y = \sin^{-1} \left(rac{2x}{1+x^2}
ight)$$

9. Find
$$rac{dy}{dx}$$
 if $x=a\cos^3 t, y=a\sin^3 t.$

10. If
$$x = 3\cos t - 2\cos^3 t$$
, $y = 3\sin t - 2\sin^3 t$
then find $\frac{dy}{dx}$.

11. If
$$y = \left(\cot^{-1}x^3
ight)^2$$
 then find $rac{dy}{dx}$.

12. Find the derivative of sec^{-1}

$$\left(rac{1}{2x^2-1}
ight)$$



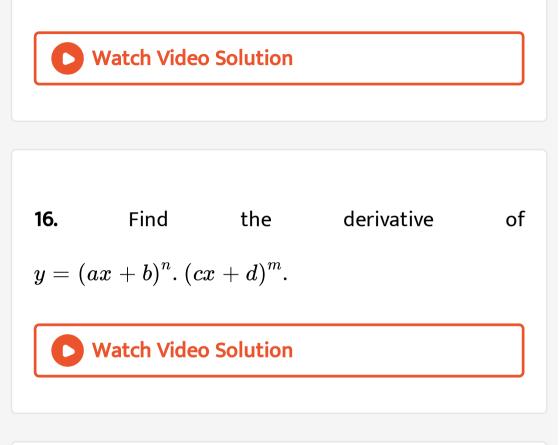
13. If
$$f(x) = e^{2x}$$
. $\log x, (x > 0)$ then find $f'(x)$.

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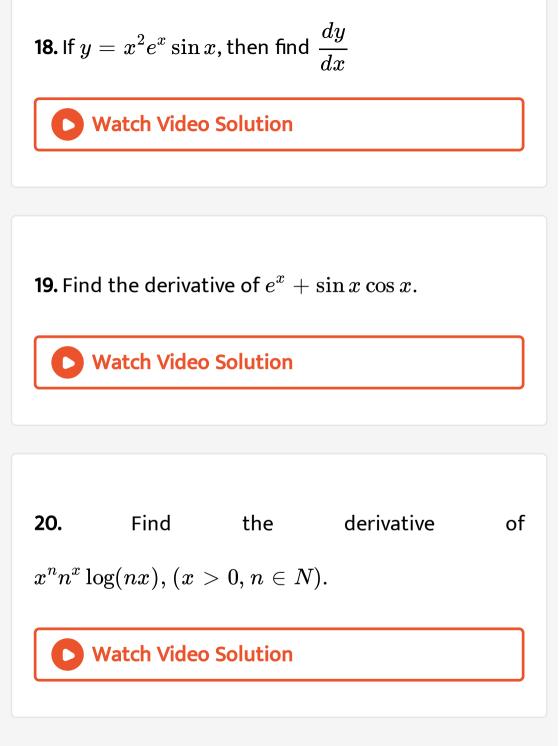
14. Find the derivative of sinmx. Cosnx.



15. Find the derivative of $y = \sin^m x \cdot \cos^n x$.



17. If
$$f(x) = x e^x \sin x$$
 then find $f'(x)$.



21. Find the derivative of
$$\left(rac{1}{x}-x
ight)^3 e^x$$

22. If
$$y=rac{a-x}{a+x},\,(x
eq-a)$$
 then find $rac{dy}{dx}$

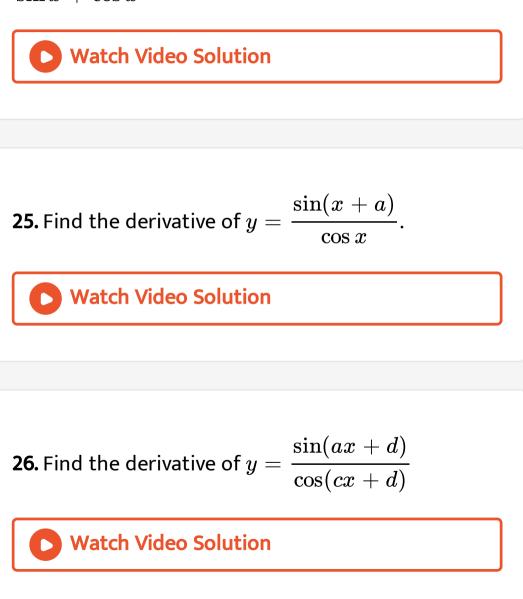
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23. Find the derivative of
$$y=rac{px^2+qx+r}{ax+b}$$

24. Find the derivative of the function

 $\cos x$

 $\sin x + \cos x$





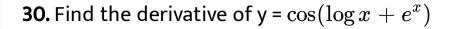
$$\frac{1}{ax^2 + bx + c}$$

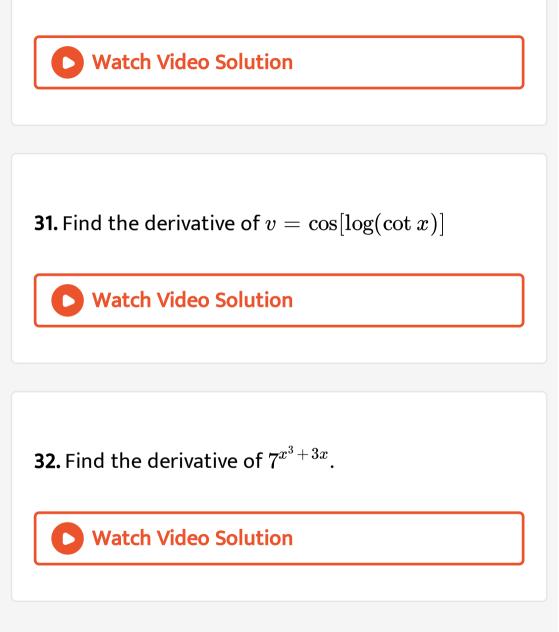


28. If $f(x) = \sin(\log x), \, (x>0)$ then find f'(x)

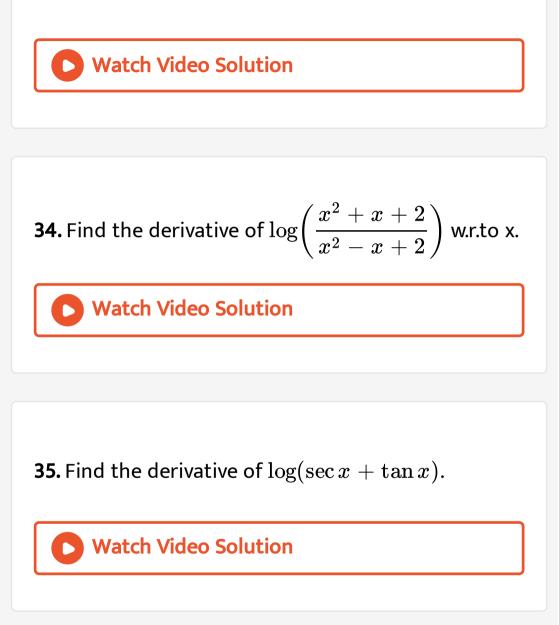
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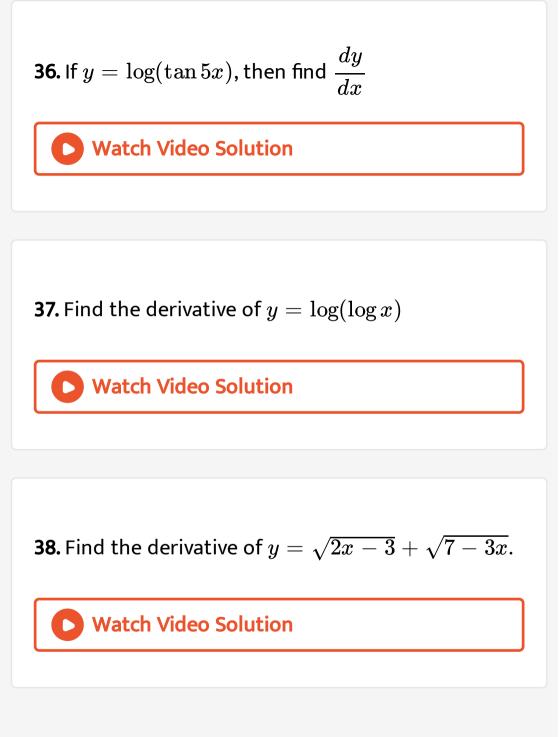
29. Find the derivative of y = $\sin \left[\cos(x)^2 \right]$



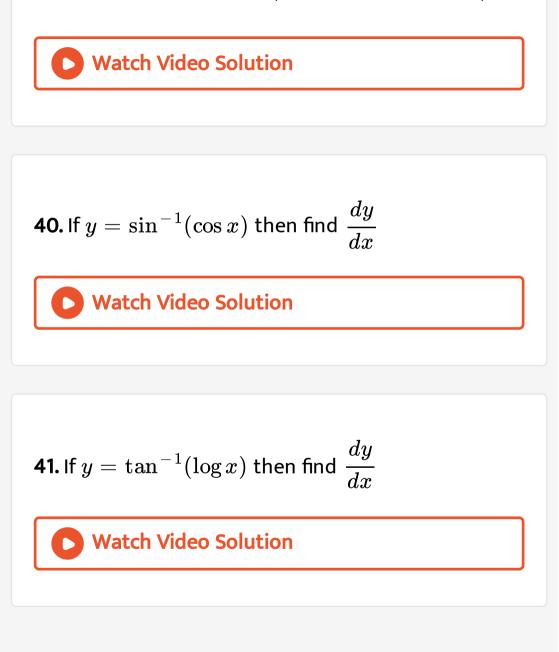


33. Find the derivative of $20^{\log(\tan x)}$.

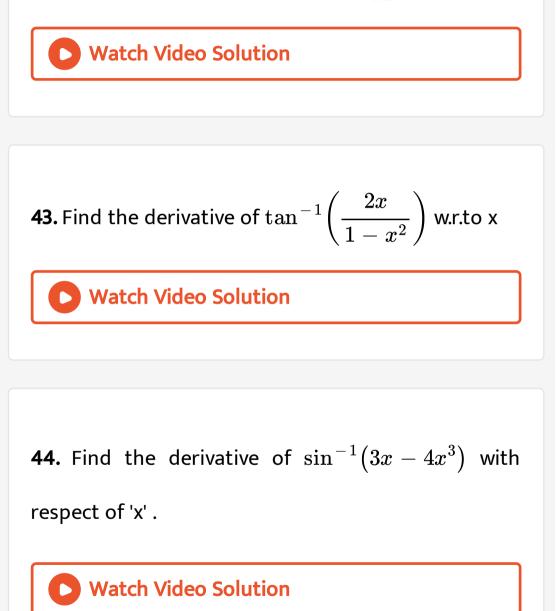


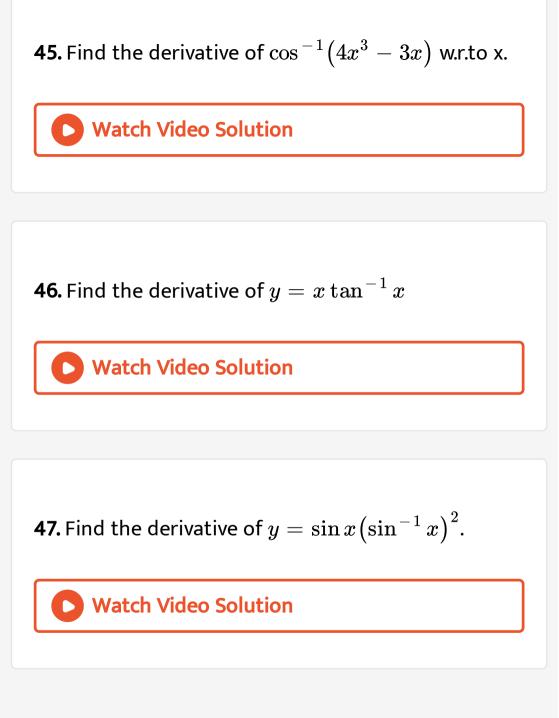


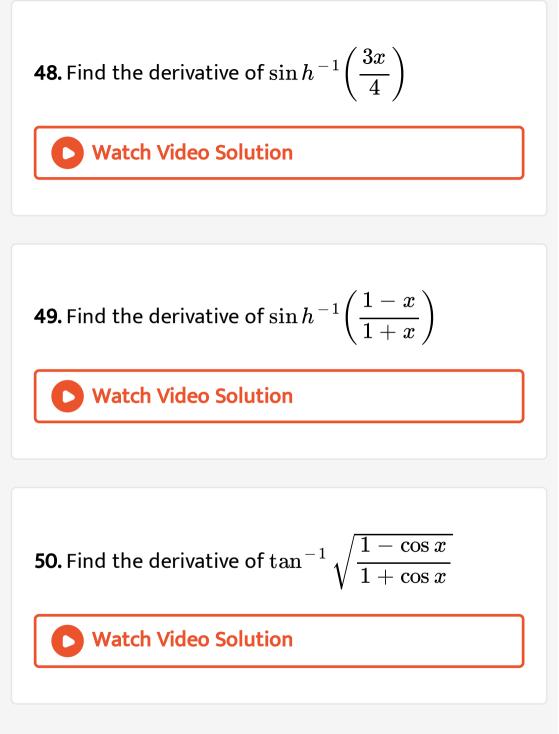
39. Find the derivative of $\left(x^3+6x^2+12x-13
ight)^{100}$



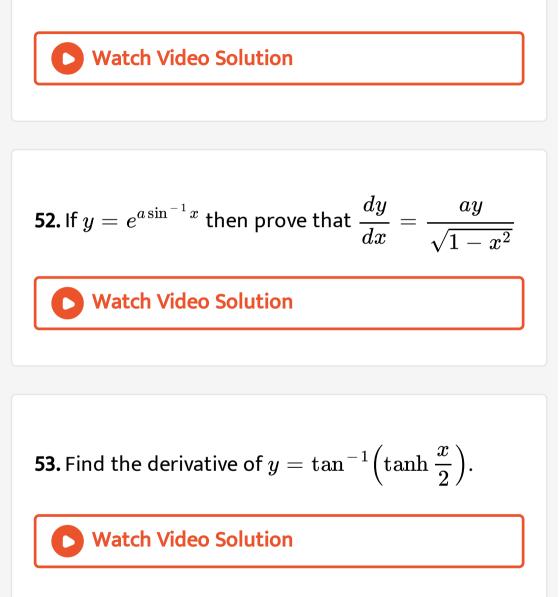
42. If
$$y = an^{-1} igl(\cos \sqrt{x} igr)$$
 then find $rac{dy}{dx}$



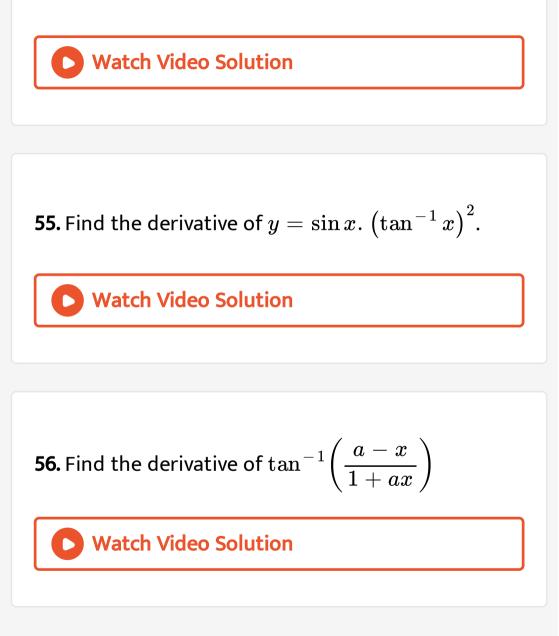




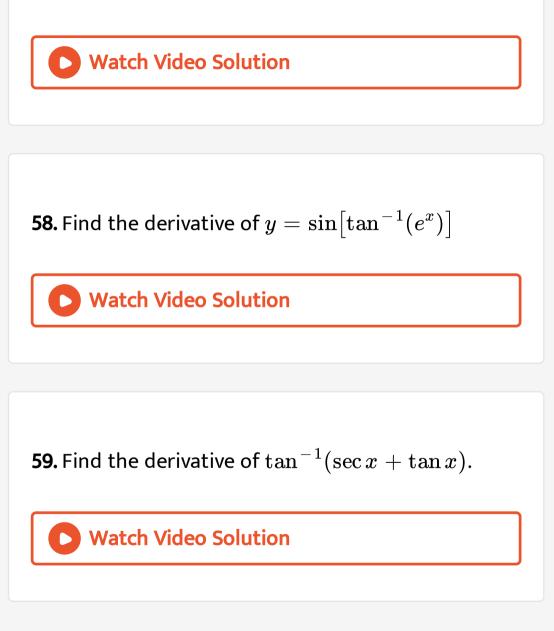
51. Find the derivative of $y = e^{\sin - 1}x$.



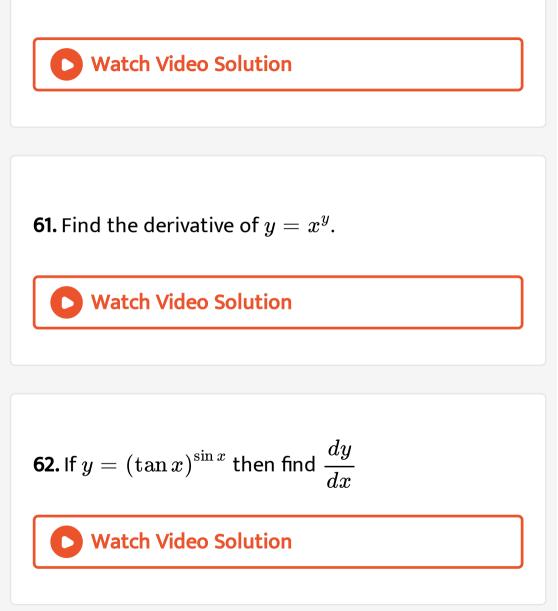
54. Find the derivative of $y = \cot^{-1}(\cos ec 3x)$.



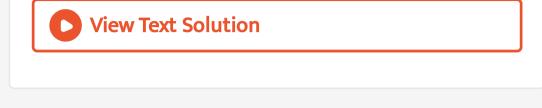
57. Find the derivative of $\log(\sin^{-1}e^x)$



60. Find the derivative of x^x .



63. Find the derivative of $(\log x)^{\tan x}$



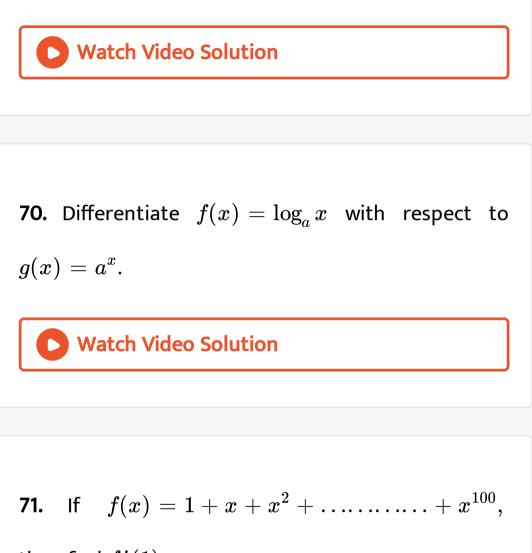
64. If
$$y=e^t+\cos t, x=\log t+\sin t$$
 then find $\displaystyle rac{dy}{dx}.$

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65. Find
$$rac{dy}{dx}$$
 if $2x^2 - 3xy + y^2 + x + 2y - 8 = 0$.

66. Find
$$\frac{dy}{dx}$$
 if $x^3 + y^3 - 3axy = 0$
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67. Find the derivative of $x^4 + y^4 - a^2xy = 0$ w.r.to
x
Match Video Solution
68. Differentiate $f(x) = e^x$ w.r.to $g(x) = \sqrt{x}$.
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69. Differentiate $f(x) = e^{\sin x}$ w.r.to $g(x) = \sin x$.

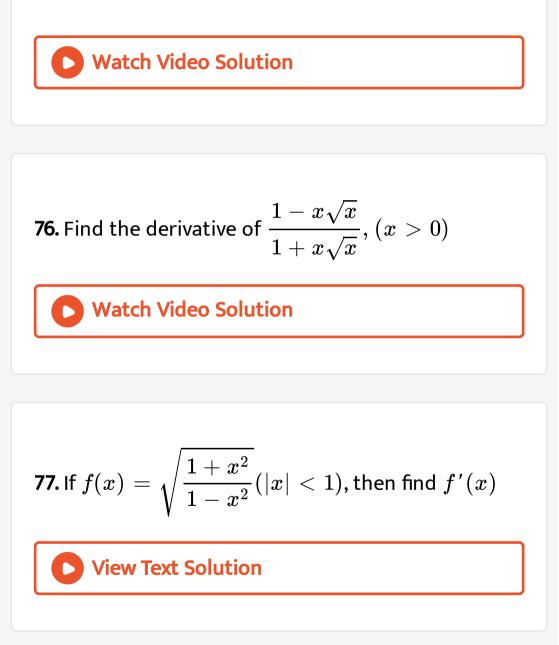


then find f'(1).

72. Find the derivative of
$$(\sqrt{x} - 3x)\left(x + \frac{1}{x}\right)$$

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73. Find the derivative of $5 \sin x + e^x \log x$.
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74. Find the derivative of $5^x + \log x + x^2 e^x$
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75. Find the derivative of $y = e^{2x} \log(3x + 4)$



78. Find the derivative of
$$\tan^{-1}\left(\frac{3a^2x-x^3}{a(a^2-3x^2)}\right)$$
.



79. If
$$f(x)=2x^2+3x+5$$
, then prove that $f'(0)+3f'(-1)=0$

80. If the function $f(x) = egin{cases} x & ext{if} & 0 \leq x \leq 2 \\ 2 & ext{if} & x \geq 2 \end{cases}$

derivable at 2? Justify.

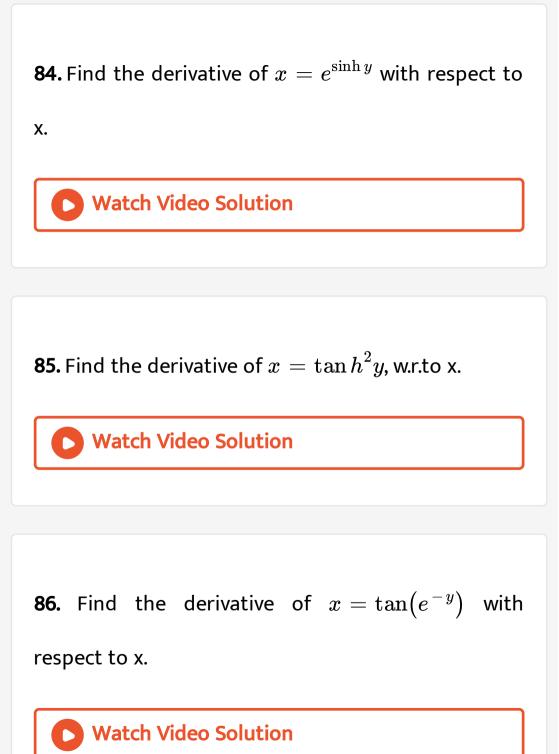
81. If
$$x = a \left[\cos t + \log \tan \left(\frac{t}{2} \right) \right], y = a \sin t$$
 then find $\frac{dy}{dx}$.

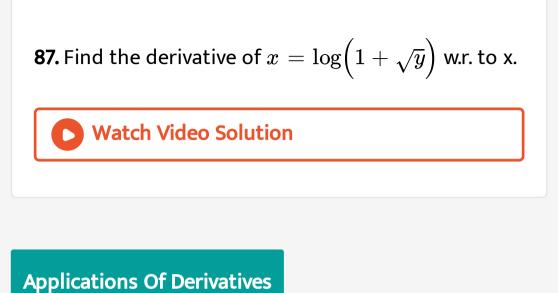
82. If
$$y=x^x(x>0), ext{ find } rac{dy}{dx}$$

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83. Find the derivative of $x=\sin h^2 y$ w.r.t x.

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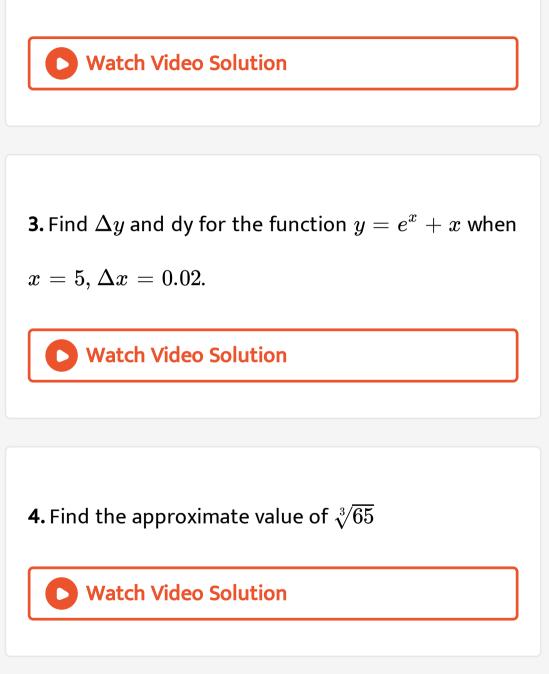




1. Find
$$\Delta y$$
 and dy for the function $y=x^2+x$,

when $x=10, \Delta x=0.1$

2. Find the approximate value of $\sqrt{82}$



5. Verify Rolle's theorem for the function $y = f(x) = x^2 + 4$ on [-3,3]

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6. Verify Rolle's theroem for the function x^2-1 on

[-1,1]`.

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7. Let
$$f(x) = (x - 1)(x - 2)(x - 3)$$
 then prove

that there is more than one 'c' in (1,3) such that $f^{\,\prime}(c)=0$



8. If
$$y = x^2 + 3x + 6$$
 then find $riangle y$ and dy when

$$x=10, \ riangle x=0.01.$$

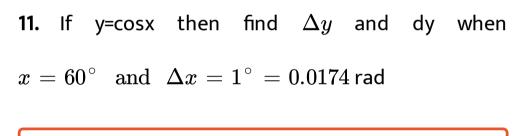
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9. Find
$$(\Delta y)$$
 and dy if $y=5x^2+6x+6, x=2$ and

 $\Delta x = 0.001$

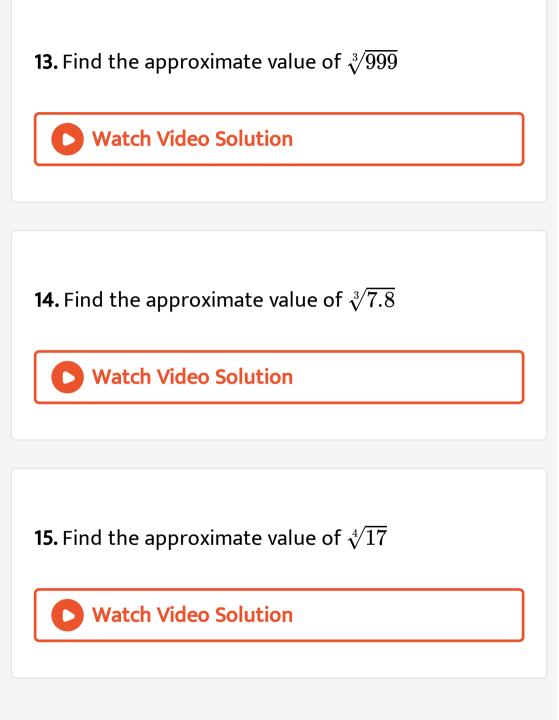
10. Find Δy and dy for function y = 1/(x+2)when $x = 8, \Delta x = 0.02$.



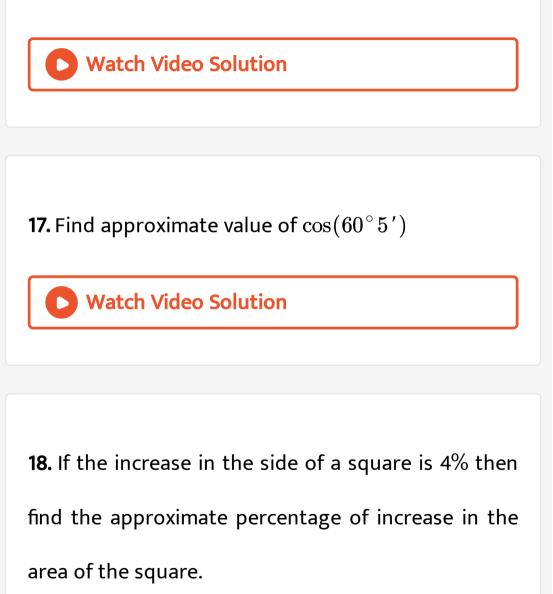


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12. Find the approximate value of $\sqrt{25.001}$



16. Find the approximate value of $\sin 62^\circ$



19. If the increase in the side of a square is 2% then find the approximate percentage of increase in the area of the square.



20. The side of a square is increased from 3 cm to 3.01 cm. Find the approximate increase in the area of the square.

21. The radius of a sphere is measured as 14 cm. Later it was found that there is an error 0.02 cm in measuring the radius. Find the approximate error in surface of the sphere.



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22. If the radius of a sphere is increased from 7 cm

to 7.02 cm. then find the approximate increase in the

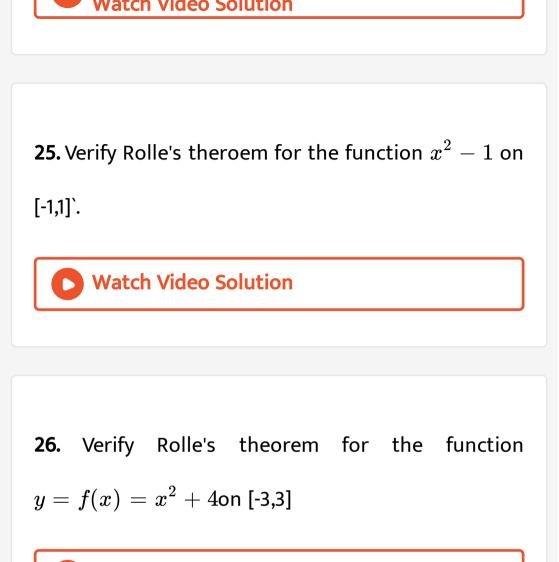
volume of the sphere.



23. The diameter of a sphere is measured to be 40 cm. If an error of 0.02 cm is made in it, then find approximate errors in volume and surface area of the sphere.



24. The time t of a complete oscillation of a simple pendulum of length I is given by $t2\pi\sqrt{\frac{l}{g}}$ where g is gravitational constant. Find the approximate percentage of error in t when the percentage of error in I is 1%.



27. Verify the conditions of Lagrange's mean value theorem for the function $x^2 - 1$ on [2,3] Watch Video Solution

28. Verify Lagrange's mean value theorem for the

function $f(x)=x^2$ on [2,4]

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29. Find c so that
$$f'(c) = rac{f(b) - f(a)}{b - a}$$
 where $f(x) = e^x, a = 0, b = 1$



30. If the equation $x^2 + 5x + K = 0$ has real and

distinct roots, then

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31. Find the slope of the tangent to the curve $y = x^3 - x + 1$ at the point whose x co-ordinate is 2.

32. Find the slope of the tangent to the curve, $y = x^3 - 3x + 2$ at the point whose x co-ordinate is 3.



33. Find the slopr of the tangent to the curve $y = rac{x-1}{x-2}$ at $x \neq 2$ and x = 10.

34. Find the slope of the normal to the curve $x=a\cos^3 heta,\,y=a\sin^3 heta$ at $heta=\pi/4.$



 $y=x^3-3x^2-9x+7$ is parallel to the x-axis.

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36. Find the point on the curve $y = x^3 - 11x + 5$ at

which the tangent is y = x - 11

37. Find the equation of the tangent and normal to

the curve $y=x^3$ at (1,1)

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38. Find the equation of tangent and normal to the

curve $y = x^4 - 6x^3 + 13x^2 - 10x + 5$ at (0,5).

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39. Find the equations of the tangent and normal to

the curve $y = x^2$ at (0,0).

40. Find the equations of the tangent and normal to

the curve
$$y=rac{1}{1+x^2}$$
 at (0,1).

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41. Find the equation of tangent and normal to the

curve
$$x=\cos t, y=\sin t, ~~ ext{at}~~t=rac{\pi}{4}$$

42. Find the equations of tangent and normal to the

curve xy = 10 at (2, 5)

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43. On the curve $y = x^2$, find a point at which the

tangent is parallel to the chord joining (0,0) and (1,1).

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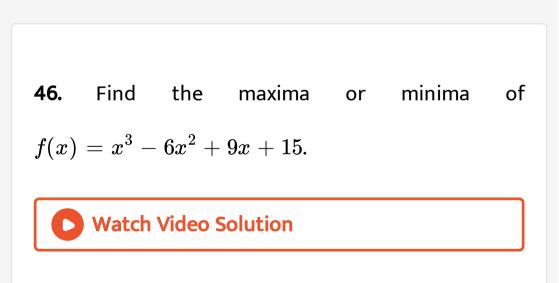
44. Find a point on the curve $y = x^3$, when the

tangent is parallel to the chord joining (1,1), (3,27).



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45. Find a point on the graph of the curve $y = (x - 3)^2$, where the tangent is parallel to the chord joining (3,0) and (4,1)



47. Find the maxima and minima of
$$f(x) = \frac{x}{2} + \frac{2}{x}, (x > 0).$$

48. Define the strictly increasing function and strictly

decreasing function on an interval.

