

OPTIMISATION USING DIFFERENTIATION

In these diagrams the solid black lines have a total length of 16 units. Find the value of x ($x \geq 0$) which maximises the pink area and hence this maximum area.

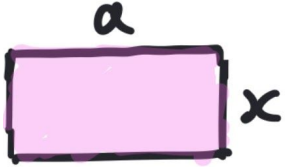
Diagram	Equation for Area	Find A in terms of x	Differentiate $A(x)$
			
	Find a in terms of x		
Find SPs	Nature table		Conclusion

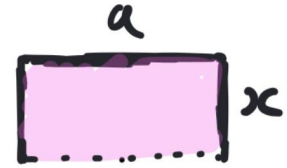
Diagram	Equation for Area	Find A in terms of x	Differentiate $A(x)$
			
	Find a in terms of x		
Find SPs	Nature table		Conclusion

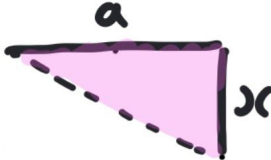
Diagram	Equation for Area	Find A in terms of x	Differentiate $A(x)$
			
	Find a in terms of x		
Find SPs	Nature table		Conclusion

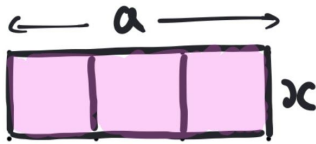
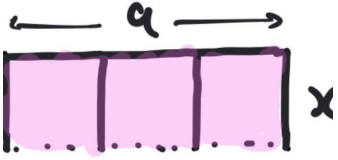
Diagram	Equation for Area	Find A in terms of x	Differentiate $A(x)$
			
	Find a in terms of x		
Find SPs	Nature table		Conclusion

Diagram	Equation for Area	Find A in terms of x	Differentiate $A(x)$
			
	Find a in terms of x		
Find SPs	Nature table		Conclusion

In these diagrams the solid black lines have a total length of 16. Find the value of x ($x \geq 0$) which maximises the pink volume and hence this maximum volume.

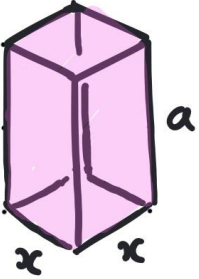
Diagram	Equation for Volume	Find V in terms of x	Differentiate $V(x)$
			
	Find a in terms of x		
Find SPs	Nature table		Conclusion

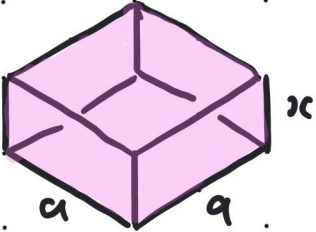
Diagram	Equation for Volume	Find V in terms of x	Differentiate $V(x)$
			
	Find a in terms of x		
Find SPs	Nature table		Conclusion

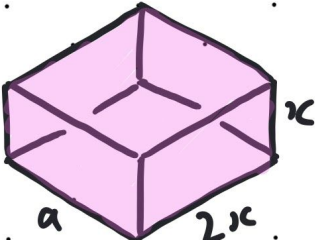
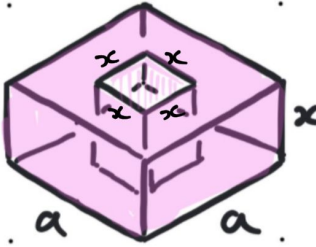
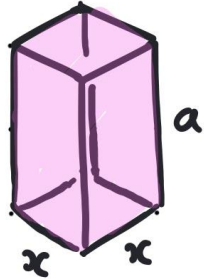
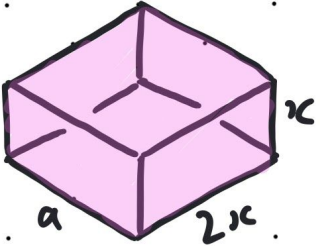
Diagram	Equation for Volume	Find V in terms of x	Differentiate $V(x)$
			
	Find a in terms of x		
Find SPs	Nature table		Conclusion

Diagram	Equation for Volume	Find V in terms of x	Differentiate $V(x)$
 <p>(hole through middle)</p>			
	Find a in terms of x		
Find SPs	Nature table		Conclusion

In this diagram the pink shape has a surface area of 16 units². Find the value of x ($x \geq 0$) which maximises the pink volume and hence the maximum volume.

Diagram	Equation for Volume	Find V in terms of x	Differentiate $V(x)$
			
	Find a in terms of x		
Find SPs	Nature table		Conclusion

In this diagram the pink shape has a volume of 16 units³. Find the value of x ($x \geq 0$) which minimizes the surface area and hence this minimum area.

Diagram	Equation for Area	Find A in terms of x	Differentiate $A(x)$
	<p>Find a in terms of x</p>		
Find SPs	Nature table		Conclusion