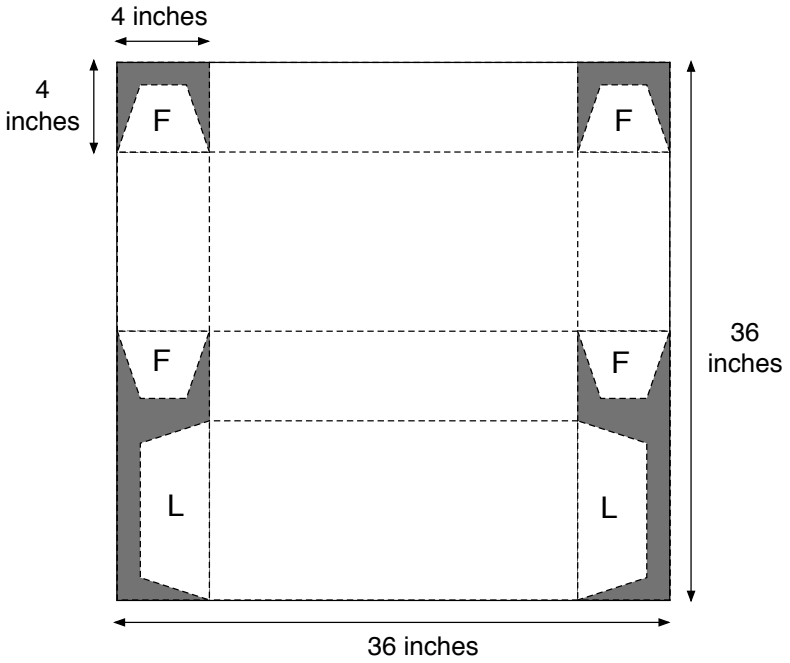
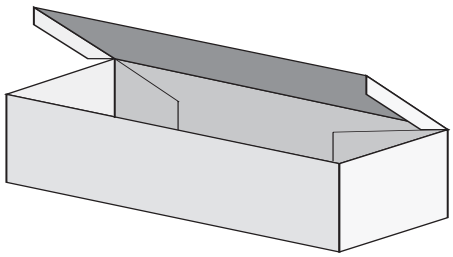
Fruit Boxes

A grocer wants to sell fruit in boxes.
He wants to make the boxes from square card 36 inches long and 36 inches wide as shown.





(Diagrams not drawn to scale.)

The shaded areas are cut away and the rest is folded along the dashed lines.
The sides are folded up and stuck together using the four flaps marked F.
The lid has two flaps, marked L, which are not glued.

1. Calculate the volume of the finished box. Show your work.

Please continue your work on the page opposite

Fruit Boxes (continued)

2. Suppose he starts with the same square of card, but changes the 4 inches to a different measurement. What is the largest volume he can make the box? Show your calculations.

	Fruit Boxes	Rubric	
		Points	Section points
1.	The dimensions of the box are (4”) x 28” x 14” Award 1 point for each of 28” and 14”.	2 x 1	
	The volume is therefore 1568 inches^3 (follow-through)	1	3
	Uses a logical, sensible approach such as; Tries 3”, then 5”, sees that 5” gives a bigger answer, so tries 6”, 7” etc.	2	
	Partial credit: if method unclear, but apparently correct.	(1)	
	Correct calculations of volume between height = 5” and height = 7”		
	height width depth volume 5 26 13 1690 6 24 12 1728 7 22 11 1694	3	
	This suggests that the maximum volume occurs at or near height = 6” and is 1728 inches^3	1	
	Any attempt to justify why it is exactly 6” (e.g. tries 5.9 and 6.1 or draws a graph)	1	
	Alternative method May find maximum value by differentiation	or 7	7
	Total Points		**10**