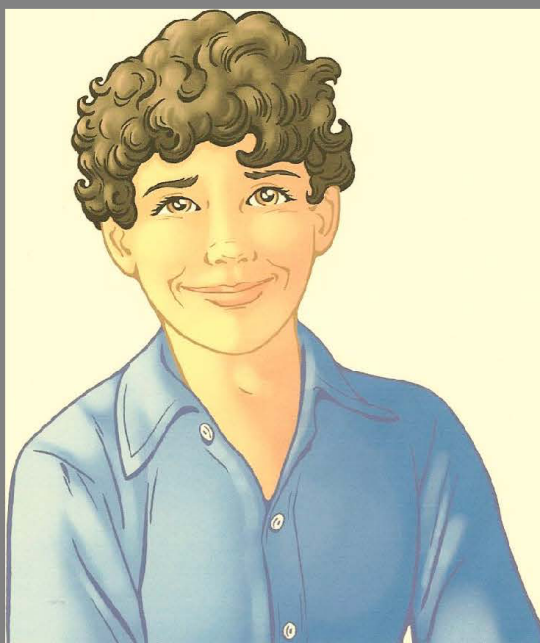THE BARTON SERIES

THANKS TO BARTON

BY

DR FAYAD W. ALI

(Ages 8 and over)

THANKS TO BARTON

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It's A Compound

It was a lovely Saturday morning when Barton walked by Mr Albernatty's home. The old gentleman was ambling around and admiring the large and colourful, flower garden which adorned the front of his house. At one corner, a trickling waterfall poured its contents into a little pool in which a few water lilies floated. Their flowers, almost lotus-shaped, varied in colour from a pale blue to white and some were of a pinkish-red hue. The front of the Albernatty's house was certainly very picturesque and attracted many admirers.

Barton, as usual, paid his respects to his old and dear friend. These two people, despite their age difference, would spend many enjoyable hours together. Barton respected the man's age and admired his life's long experiences and accomplishments. These noble characteristics of the old man were rivalled only by his deep generosity.

The Albernattys had no children of their own and Mr Albernatty, together with his wife, seemed to live a happy and contented life. Mr Albernatty worked hard in his garden, often alongside his several workers. Both Mr and Mrs Albernatty had, over the years, taken a great liking to the young boy, Barton. They loved his manners and were charmed by his courtesy, intelligence, demeanour, and other notable qualities.

They also respected Barton's brilliance and sharp thinking skills, at times which seemed uncommon for a boy of his age. Also, they admired his kindness and consideration that he had for peoples of all ages and especially animals and the environment.

Often, Barton's skill in mathematics was very helpful in Mr Albernatty's projects and the aged gentleman would ask for Barton's opinion in many of his financial ventures. Today was one of those days.

The old man quickly beckoned to Barton.

The young boy entered the gates of the Albernatty's domain and the old gentleman walked across to meet with his young friend.

As it turned out, Mr Albernatty was interested in the purchase of a plot of land in the nearby village. However, the land was of a rather peculiar shape. Mr Albernatty was not privy to the actual area and wondered whether Barton could assist him in calculating the area of the plot. From both the calculated area and the price requested by the owner, Mr Albernatty would be able to assess whether or not the investment was financially favourable.

Young Barton was always willing to help Mr Albernatty. Further to this, he embraced any opportunity for which the skills of mathematics that were taught to him held a practical use. As he grew older, Barton saw this connection more and more in his everyday life.

"I shall be more than happy to try," answered the willing Barton.

Mr Albernatty smiled and led him to the inside of his beautifully decorated house and into the living room.

On a small table lay the outline of what looked like a map. As Barton sat in the nearby chair, the old man came closer. He had a pencil, blank paper and a calculator. He proceeded to explain the dimensions and the shape of the map to Barton.
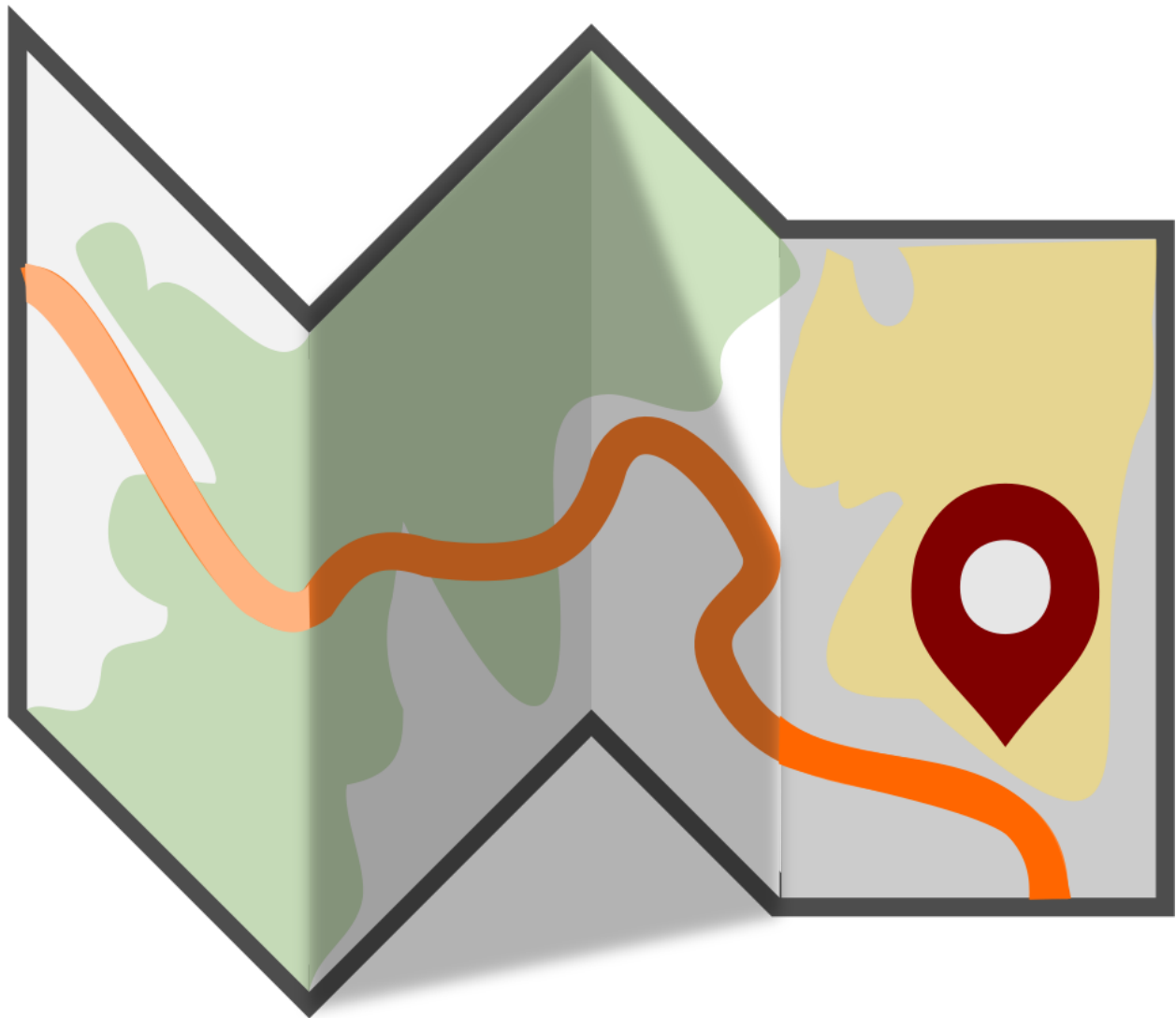
As Barton listened intently to Mr Albernatty, he gently pushed aside the calculator.

"I would prefer to use my skills of arithmetic in this venture," he advised Mr Albernatty.

The old gentleman only smiled.

"My mental arithmetic is greatly improved when I work without the calculator," added Barton.

Old Mr Albernatty shook his head and smiled again. Such devices did not exist when he was a small boy.

The map of the property lay on the small table and the plot of land was truly of a rather peculiar shape. Barton smiled as he looked at it.

"Shapes as that of the map cannot be described in one word as one could do for a square or a rectangle or other similar shapes," said Barton to Mr Albernatty.

Barton had learned in class that such shapes as squares, circles and rectangles were called definite or simple shapes. One would need only to apply a rule to obtain their respective area or perimeter.

However, when two or more definite shapes are placed together side by side, they are called compound shapes. Barton looked at the map of the land and he thought carefully about it. Certain lessons that the young boy had learned in class, began to tease his active brain.
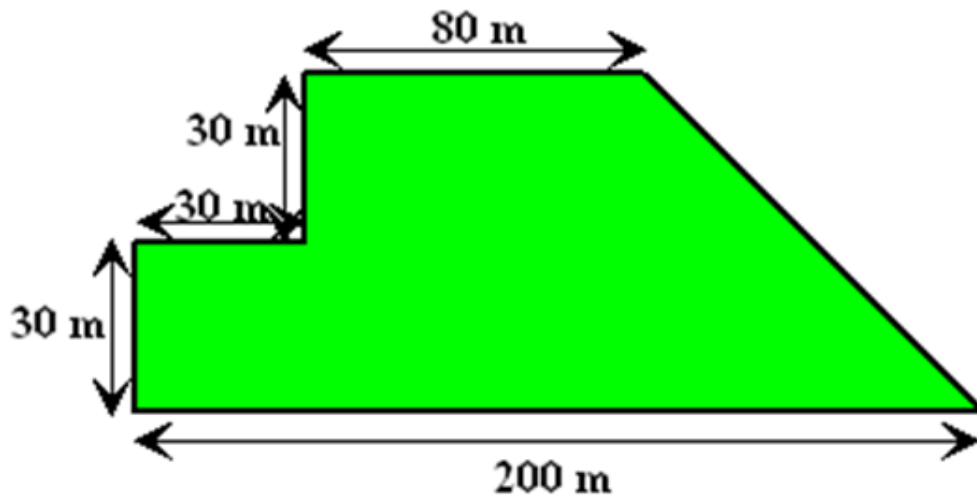
"This is indeed an example of what we would call a compound shape," he said to Mr Albernatty.

"The measurements of the sides are clearly written on the diagram and I can surely find the exact area," said the young and eager boy.

"Could you explain all the steps of the procedure to me, Barton?" asked Mr Albernatty. "Maybe I'll learn a thing or two," laughed the old man.

"I shall try to be as good a teacher as my Miss," said Barton smilingly. "Furthermore, I shall be most happy to do so," added the young Barton, feeling important and proud.

Barton asked Mr Albernatty to sit next to him and the old man willingly obliged the request.

"First of all," began the young tutor, "there is no single rule that I can apply to obtain the area of this plot of land all at once. This would be something that I could have done if it was of a definite shape and which this is not."

Mr Albernatty sat quietly during the explanation thus far.

"However," continued Barton, "this compound shape consists of two or more definite shapes and each of whose separate areas I can find. So, I shall therefore first divide or separate the plot into these definite shapes."

The old man nodded with his following of the lesson.

"I understand exactly what you are attempting to do," he said.

Mr Albernatty crept forward in his chair and waited for the lesson to continue from his confident young tutor.

"Now," said the tutor, I shall begin to divide the entire plot with its compound shape into smaller definite or simple shapes. These will all be shapes that we both know and with which we are familiar. I can easily find the area of each of the simple shapes and then we can add them all up to get the total area of the entire plot."

Barton took the pencil and he began to draw.
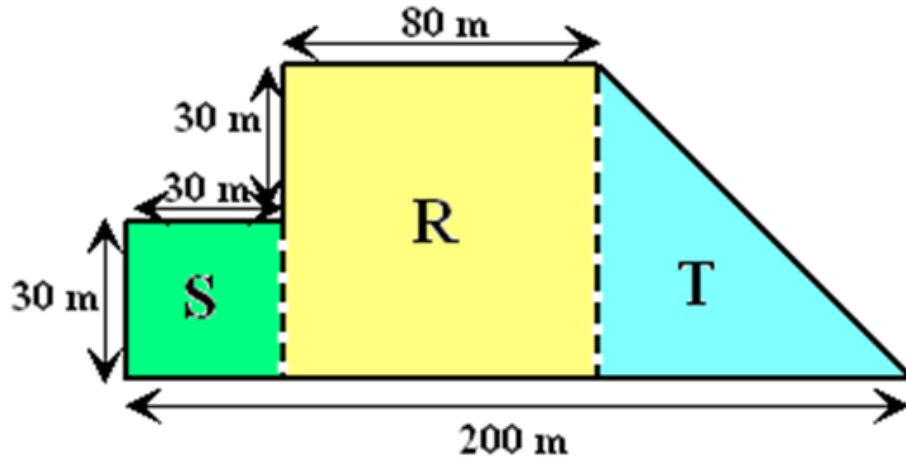
"Do you see these three divided regions, Mr Albernatty?" asked Barton.

"I do," said the old man, as he listened to the young boy. He certainly held a deep admiration for young Barton.

"Now," said Barton, "for convenience, I shall give a name to each of three separate regions. I shall call them, **S**, **R**, and **T**.

"Is there any reason why you chose those letters, Barton?" asked the curious old man.

"I could have named them by any letter or symbol that I wished," replied Barton, "and this is done only for convenience," Barton added. "In questions like these, I prefer the use of letters," Barton explained further to the sole member of his small class.

"I called one of the regions S because it is a square and the first letter of the word SQUARE is S. So, too, I chose to call another of the regions R as it is a rectangle and the first letter of the word RECTANGLE is R. Lastly, I called the other region T as it is a triangle and the first letter of the word TRIANGLE is the letter, T."

"That's pretty clever," said Mr Albernatty, and the old man laughed heartily.

"If I was to similarly divide such a plot for the rearing of animals, I would name them, **P**, **C** and **G**," laughed the old man again.
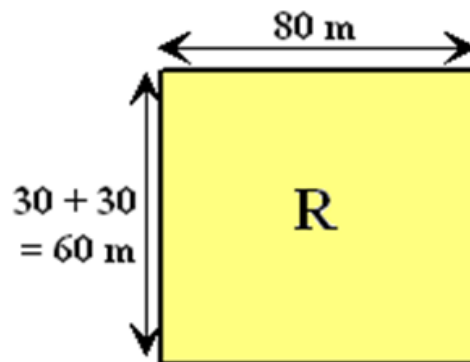
"I shall have Pigs, Cows and Goats, he muttered, hardly able to control his laughter.

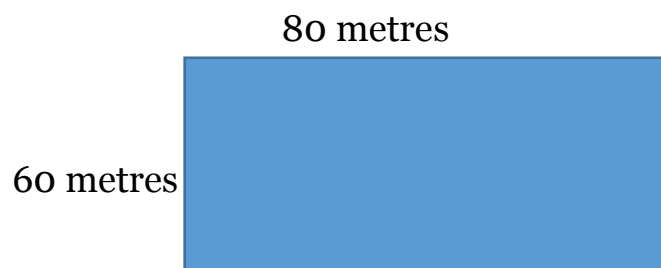Barton was also amused but was anxious to continue the lesson.

"Now," said Barton, "we begin the next stage of the procedure."
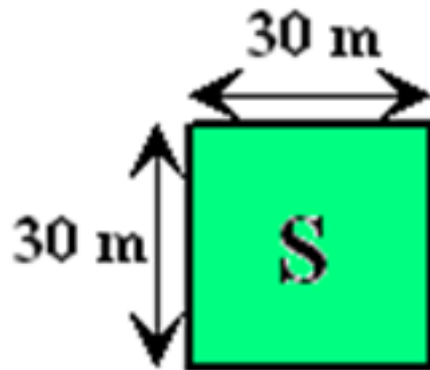
"The area of the square region, S, is side multiplied by side. This is 30 m x 30 m = 900 m². We take note of this.

Secondly, we find the area of a second region, which is the rectangle R. The area of the rectangle is the length multiplied by the width.

This is 80 m x 60 m = 4 800 m². Again, we note this figure of 4 800 m². Now, we find the area of the third region, which we agreed is the triangle.
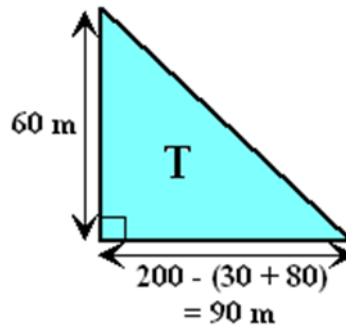
The area of the triangle is ½ (the length of the base multiplied by the perpendicular height).

This is ½ (90 m x 60 m) = 2 700 m². Now we total the areas of all the three regions that were combined to give the entire shape. We would get:

$$
\begin{array}{r}
900 \\
4800 + \\
2700 \\
\hline
8400 \\
\hline
\end{array}
$$

The total is seen as 8 400."

Mr Albernatty was all ears as Barton announced the result.

"Mr Albernatty," he said, "the total area of the plot of land that you have shown to me is 8400 square metres."

The old man smiled broadly. He was impressed with the mathematics that he saw.

"I followed what you did," he said. "You are a good teacher."

Barton smiled proudly.

"You must feel quite proud to display the skills of mathematics that you have mastered?" asked the old man.

"I do and it does feel quite good," replied Barton. "But it feels so much greater when one knows how to use these skills and to apply these rules in everyday life. It feels as though the mathematics that we learn at school comes to life," Barton added.

The old man laughed again. He shook his head in regret that such an opportunity did not come his way.

"Thanks to you, Barton, I shall consider whether or not the price is fair now that I know the area. I shall soon make a decision one way or the other. Let us go to the kitchen by Mrs Albernatty and have a glass of cold, refreshing orange juice," he said, still chuckling.

Mr Albernatty placed his arm around the shoulder of his little friend.