

Graduated Problems

List of Contents

The Rectangle ...

... continued

The Pyramid

Rectangles

A graduated set of problems

What do you understand by the word 'rectangle'?

Write an explanation or definition of the word.

Is a square also a rectangle? Explain your reasons.

What other mathematical words do you associate with a rectangle?

Describe the symmetry properties of a rectangle.

1. A rectangle measures 7.5 cm by 13.8 cm. What is its area?
 2. A rectangle measures 3.4 cm by 9.5 cm. What is its perimeter?
 3. A rectangle has an area of 64.32 cm^2 and one edge measures 4.8 cm. What is the length of the other edge?
 4. A rectangle has a perimeter of 32.6 cm and one edge measures 5.6 cm. What is the length of the other edge?
 5. A rectangle has an area of 100 cm^2 .
List **at least four** possibilities for the lengths of its edges.
 6. A rectangle has a perimeter of 100 cm.
List **at least four** possibilities for the lengths of its edges.
 7. A rectangle has an area of 80 cm^2 . What is -
(a) the smallest (b) the greatest
possible perimeter it can have?
 8. A rectangle has a perimeter of 80 cm. What is -
(a) the smallest (b) the greatest
possible area it can have?
-
9. A rectangle measures 5.2 cm by 16.5 cm.
What is the length of its diagonal?
 10. The diagonal of a rectangle measures 26.5 cm and one edge is 9.6 cm.
What is the length of the other edge?
 11. One edge of a rectangle is 6.8 cm long.
List **at least three** possibilities for the sizes of its other edge and its diagonal.
 12. The diagonal of a rectangle is 11.4 cm long.
List **at least three** possibilities for the sizes of its edges.
 13. A rectangle has a diagonal of length 21.4 cm. What is -
(a) the smallest (b) the greatest
possible area it can have?
-

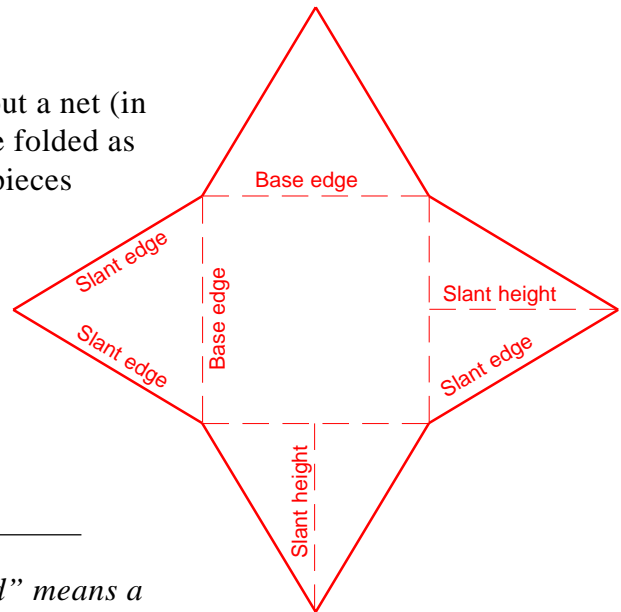
Rectangles (continued)

14. A rectangle measures 6.9 cm by 14.2 cm.
What is the size of the angle between the diagonal and the **longer** edge?
15. A rectangle measures 7.3 cm by 10.1 cm.
What is the size of the **smaller** angle at which the diagonals cross?
16. The shorter edge of a rectangle measures 5.6 cm and its diagonal 10.8 cm.
What is the size of the angle between the diagonal and the **longer** edge?
17. The longer edge of a rectangle measures 13.7 cm and its diagonal 18.2 cm.
What is the size of the angle between the diagonal and the **longer** edge?
-
18. The longer edge of a rectangle measures 8.46 cm and the angle between this edge and the diagonal is 34.7 degrees.
What is the length of the shorter edge?
19. The angle between the longer edge of a rectangle and the diagonal is 26.3 degrees.
The shorter edge measures 4.21 cm.
What is the length of the longer edge?
20. The angle between the diagonal and the longer edge of a rectangle is 40.2 degrees.
The length of the diagonal is 13.3 cm.
Find the length of the longer edge.
21. The shorter edge of a rectangle is 11.4 cm long and makes an angle of 57.6 degrees with the diagonal.
Calculate the length of the diagonal.
22. The diagonal of a rectangle makes an angle of 29.5 degrees with one edge.
One edge of the rectangle measures 9.37 cm. What is the length of the other edge?
23. The diagonals of a rectangle cross each other at an angle of 75 degrees.
One edge of the rectangle measures 16.3 cm. Find the length of the other edge.
-
24. A rectangle has an area of 25.92 cm² and a perimeter of 24.6 cm.
What are the lengths of its edges?
25. The diagonal of a rectangle measures 50.5 cm and its area is 1266.72 cm².
Find the length of the longer edge.
26. A rectangle has a perimeter of 68.6 cm and a diagonal of length 26.5 cm.
What is the area of the rectangle?
27. The angle between the diagonal of a rectangle and one edge is 28.7 degrees.
The area of the rectangle is 57.3 cm². What is its perimeter?
-

Pyramids

A graduated set of problems

It is useful in studying these problems to cut out a net (in paper) like that shown on the right. This can then be folded as needed as a help in understanding how the various pieces of information are related. The net shown can be folded up (*along the dashed lines*) to make a right, square-based pyramid.



. What is the meaning of “right” in the description above?

Describe other sorts of pyramids

In all of the following questions, the word “pyramid” means a right, square-based pyramid.

1. A pyramid has a base edge length of 3.4 cm and a perpendicular height of 11.4 cm. What is its volume?

2. A pyramid has a volume of 158.4 cm^3 and a perpendicular height of 13.2 cm. What is the length of its base edge?

3. Find the length of the slant edge of a pyramid which has a base edge of length 9.36 cm and a slant height of 5.95 cm.
4. What is the perpendicular height of a pyramid having a base edge 13 cm long and a slant height of 9.7 cm?
5. A pyramid has a perpendicular height of 13.5 cm and a slant edge length of 18.4 cm. Find its volume.

6. Find the angle between one triangular face and the base, for a pyramid having a base edge of length 3.6 cm and a perpendicular height of 7.4 cm.
7. The angle between a triangular face and the base of a pyramid is 63° and the slant height is 17.1 cm. What is the perpendicular height?

8. A pyramid has a volume of 108 cm^3 and an angle of 74° between its base and any of its triangular faces. Find its perpendicular height.
9. What is the length of the base edge of a pyramid which has a slant edge of length 14.2 cm and an angle of 52° between its base and any triangular face?

10. The slant edge of a pyramid measures 25.2 cm and it has a volume of 2438 cm^3 . What is the length of the base edge?
11. A pyramid has a volume of 240 cm^3 and a slant height of 13.3 cm. Calculate its perpendicular height.