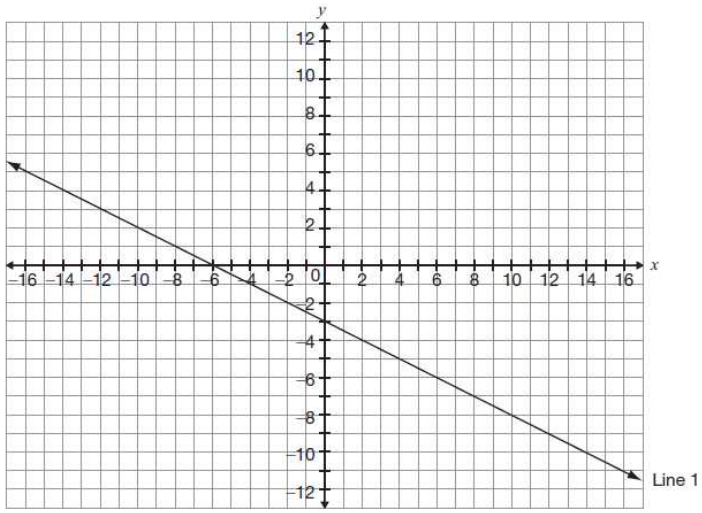
23 Lovely Lines

Line 1 is shown on the grid below.

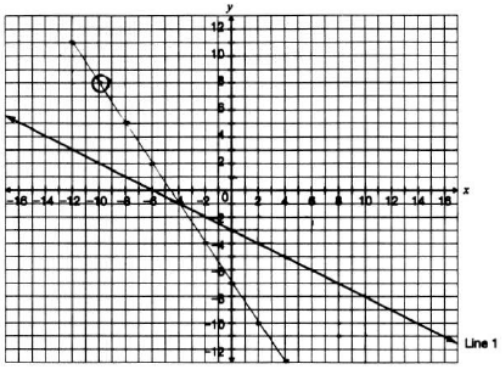


Graph Line 2 on the same grid so that it passes through A(−10, 8) and has a slope that is three times the slope of Line 1.

Justify your answer.

Lovely Lines

Line 1 is shown on the grid below.



Graph Line 2 on the same grid so that it passes through A(−10, 8) and has a slope that is three times the slope of Line 1.

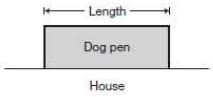
Justify your answer.

Slope of line 1 = $\frac{-1}{2} \times \frac{3}{1}$

$= \frac{-3}{2}$

The slope is three times slope 1 and it passes through (-10,8)

24 Marcus is building a rectangular dog pen along the side of his house as shown below.

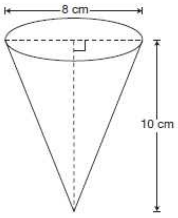


Marcus has 20 m of fencing for the 3 sides of the dog pen.

What is the length of the dog pen with the maximum area?

a 4 m
b 5 m
c 10 m
d 12 m

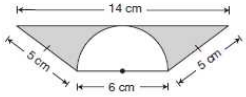
25 An open-topped paper drinking cup in the shape of a cone is pictured below.



Which is closest to the amount of paper required to make the cup?

a 185 cm^2
b 167 cm^2
c 135 cm^2
d 126 cm^2

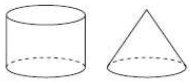
26 The diagram below is made of a trapezoid and a semicircle.



Which is closest to the area of the shaded part of the diagram?

a 2 cm^2
b 16 cm^2
c 21 cm^2
d 36 cm^2

27 The cylinder and the cone shown below have the same height and radius.

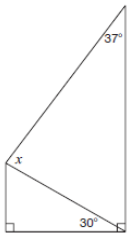


Volume of cylinder = ? × Volume of cone

What number completes this equation?

a 3
b 2
c $\frac{1}{2}$
d $\frac{1}{3}$

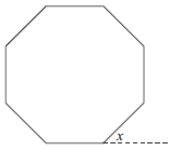
28 Consider the diagram below.



What is the value of x in the diagram?

a 30°
b 53°
c 60°
d 83°

29 Consider the regular octagon below.

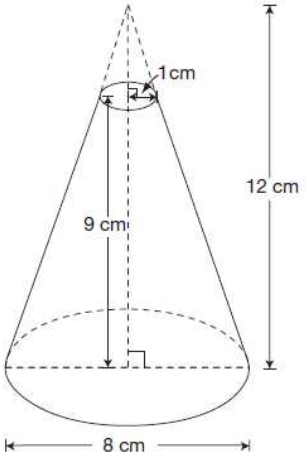


What is the value of x?

a 15°
b 30°
c 45°
d 60°

30 Cutting Cones

The figure pictured below is a cone with its top portion removed.

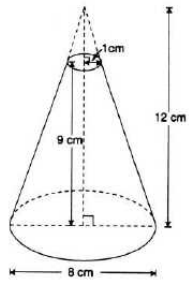


Determine the volume of this figure.

Show your work.

Cutting Cones

The figure pictured below is a cone with its top portion removed.



Volume of the cone without the tip.
$= 201.0619298 - 3.141592654$
$= 197.9203371\ cm^3$
or
$198\ cm^3$

Determine the volume of this figure.

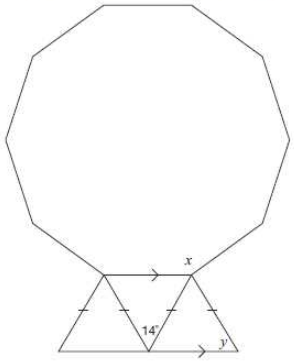
Show your work.

Volume of the cone
$= \frac{1}{3}\pi r^2 h$
$= \frac{1}{3}\pi(4)^2(12)$
$= 201.0619298\ cm^3$

Volume of the tip of the cone
$h = 9 - 12$
$h = 3$
$V = \frac{1}{3}\pi r^2 h$
$V = \frac{1}{3}\pi(1)^2(3)$
$= 3.141592654\ cm^3$

31 **Diamond Cut**

The diagram below shows a regular decagon and three isosceles triangles.

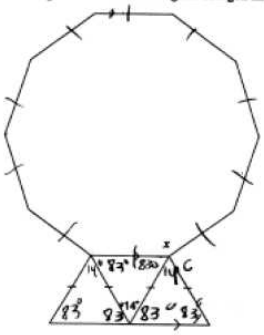


Determine the values of x and y. Justify your answers using geometric properties.

Value	Justification using geometric properties
$x =$ _____	
$y =$ _____	

Diamond Cut

The diagram below shows a regular decagon and three isosceles triangles.



Determine the values of x and y. Justify your answers using geometric properties.

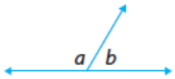
Value	Justification using geometric properties
$x =$ 1440	8 x 180 = 1440° ÷ 10 = 144° ten x 180 total degree sides
$y =$ 83°	180 - 4 ÷ 2 = 83° equilateral triangle

Angle Properties

See p. 384-385

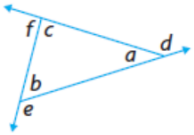
Straight Angles

The sum of angles that form a straight angle is 180°.
$\angle a + \angle b = 180°$



Interior and Exterior Angles of a Triangle

The sum of the interior angles in a triangle is 180°.
$\angle a + \angle b + \angle c = 180°$
Each exterior angle equals the sum of the two interior angles opposite it.

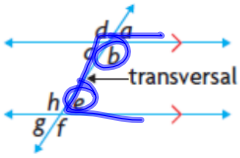


$\angle d = \angle b + \angle c$	$\angle e = \angle a + \angle c$	$\angle f = \angle a + \angle b$

Angle Properties of Parallel Lines

When a transversal crosses 2 parallel lines:

- Corresponding angles are equal.
  $\angle a = \angle e$ $\angle c = \angle g$
  $\angle b = \angle f$ $\angle d = \angle h$
- Alternate angles are equal.
  $\angle b = \angle h$ $\angle c = \angle e$
- The sum of the interior angles on the same side of the transversal is 180°.
  $\angle b + \angle e = 180°$ $\angle c + \angle h = 180°$



Key Ideas

1. The sum of the interior angles of a **triangle** is 180°.

2. The sum of the interior angles of a **quadrilateral** is 360°.

3. The sum of the interior angles of a **n-gon** is (n - 2) × 180°.

Note: a n-sided polygon is often called an n-gon. So, a 20-sided polygon is called a 20-gon.

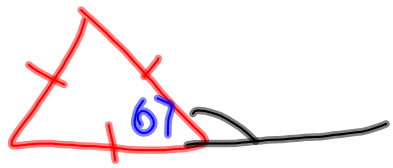
Note: A **regular polygon** has all sides equal and all angles equal.

Key Ideas

1. The sum of the exterior angles of any regular convex polygon is 360°.

2. An exterior angle and its adjacent interior angle are supplementary; they add up to 180°.

$(n-2)\times 180$



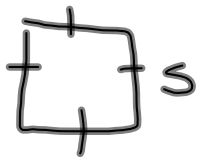
Review Section 7.1 + 7.2 notes homework questions.

Section 8.1

Rectangles with the same perimeter can have different areas, and the rectangle with a maximum area for a given perimeter is a square. Rectangles with different areas can have the same perimeter, and the rectangle with a minimum perimeter for a given area is a square.

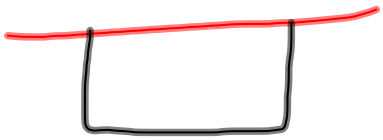
The formula for maximum area is:

$A = s^2$



The formula for minimum perimeter is:

$P = 4s$

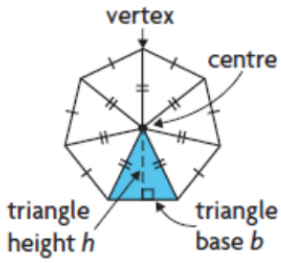


$l = P \div 2$
$w = P \div 4$

} 3-sided rectangle

The formula for the perimeter of a regular polygon is $P = n \times s$, where n is the number of sides and s is the length of each side.

To calculate the area of a regular polygon, divide it into triangles, and then, add their areas. Form the triangles by drawing a line from the centre to each vertex. The polygon side length is the base of each triangle, and the distance from the centre to the middle of each side is the height.



If the shape is NOT a square-based pyramid or cone then break the shape down into its net and solve in parts.

The volume of a pyramid is 1/3 the volume of a prism with an identical base and height.

The volume of a cone is 1/3 the volume of a cylinder with an identical base and height.