Unit 7

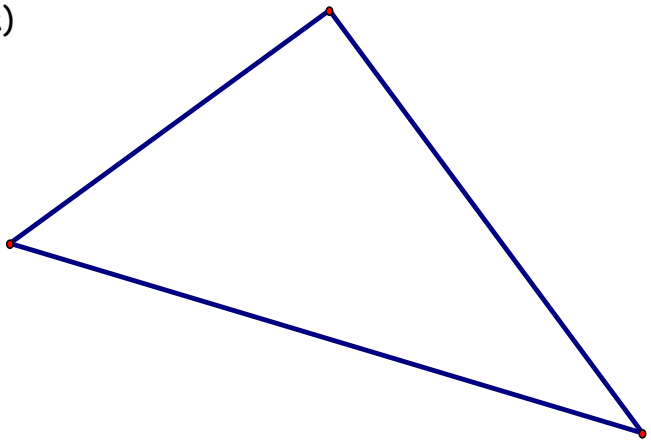
2-Dimensional Measurement

7-1 Perimeter

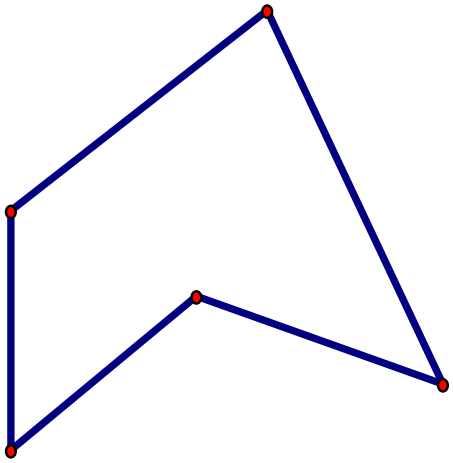
7-1 Perimeter

1. Use a ruler to find the perimeter of each shape.

a)

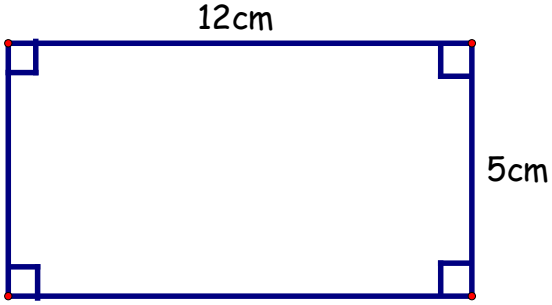


b)



2. Find the perimeter of each shape. (Diagrams are not drawn to scale.)

a)



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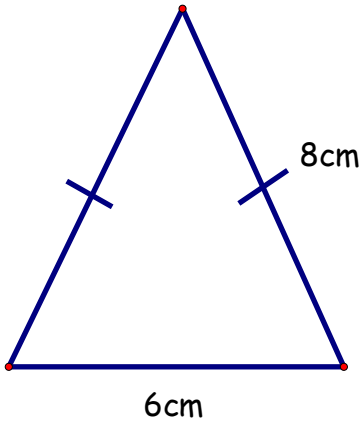

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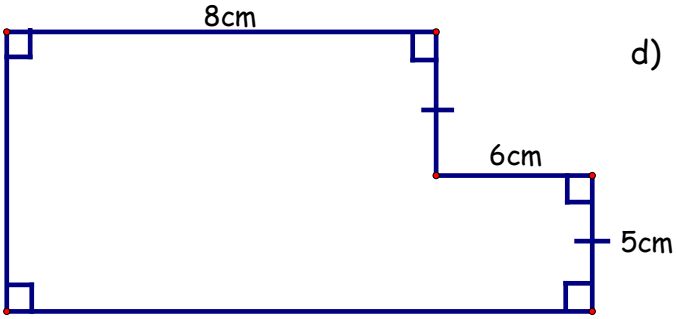

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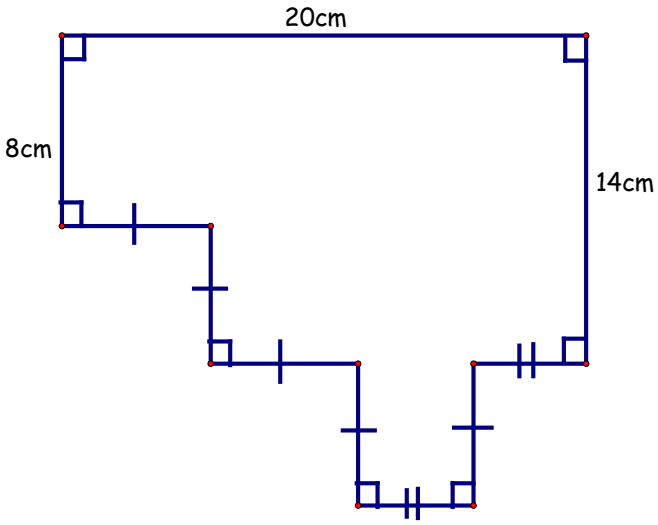

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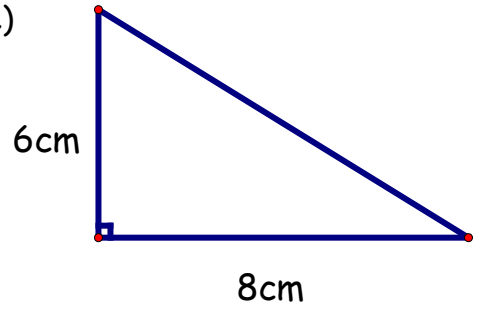

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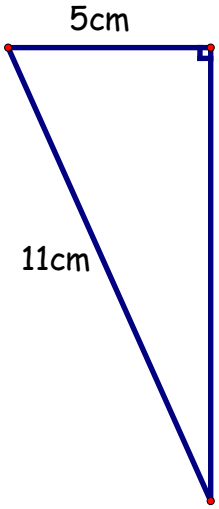

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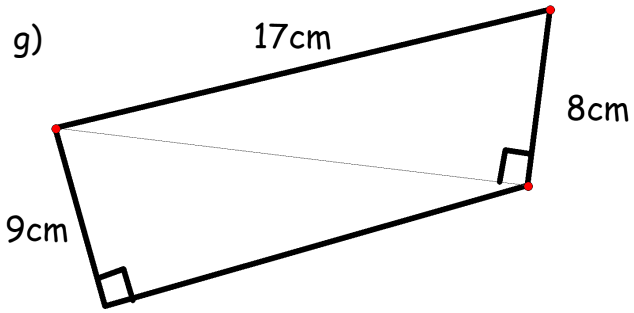

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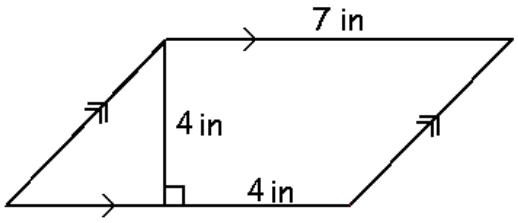

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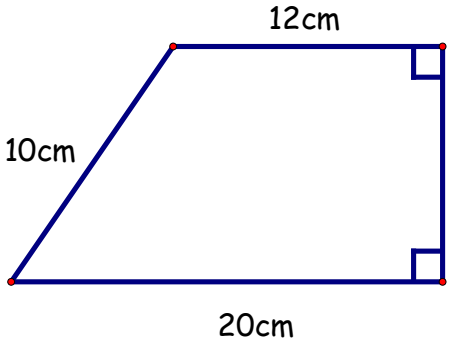

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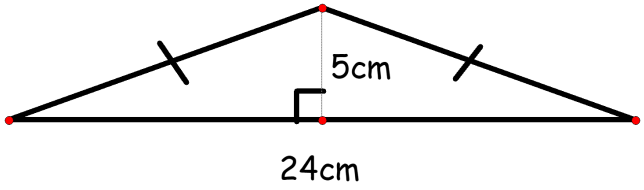


3. The perimeter of a rectangle is 26 cm, while the base is 6 cm. What is the height of the rectangle?

4. The base of a rectangle is 3 cm more than twice the height. If the perimeter of the rectangle is 72 cm, find the base and height of the rectangle.

5. Two sides of an equilateral triangle are "$3x$" m and "$x + 24$" m respectively. Find the perimeter of the triangle.

6. An isosceles triangle is a triangle in which two of the sides are equal. If each of the equal sides of an isosceles triangle is 5 times the third side and the perimeter of the triangle is 99 inches, how many inches is each of the sides of the triangle?

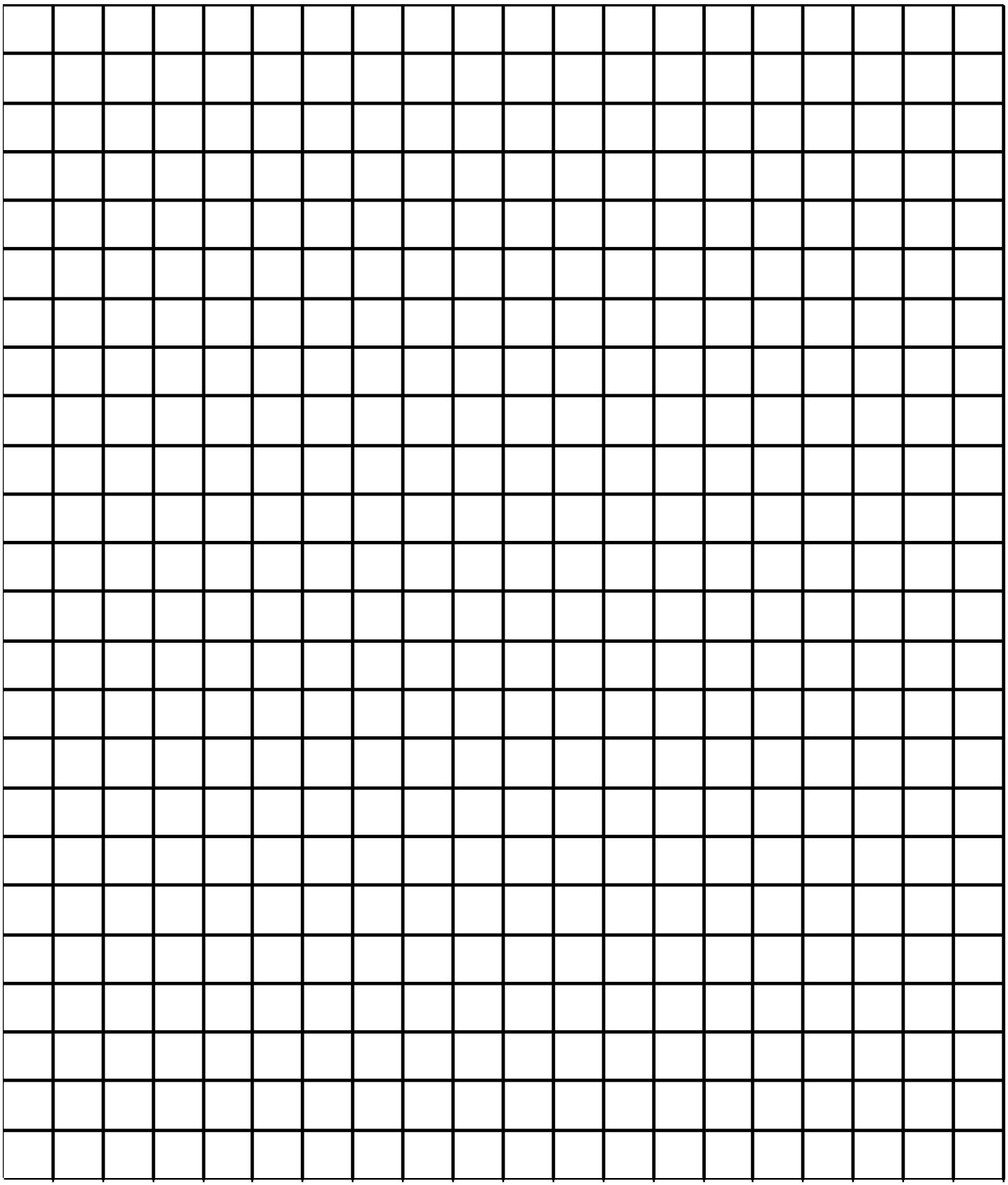
7. A rectangle has a height of 8 mm and a diagonal of 10 mm. What is the perimeter of this rectangle?

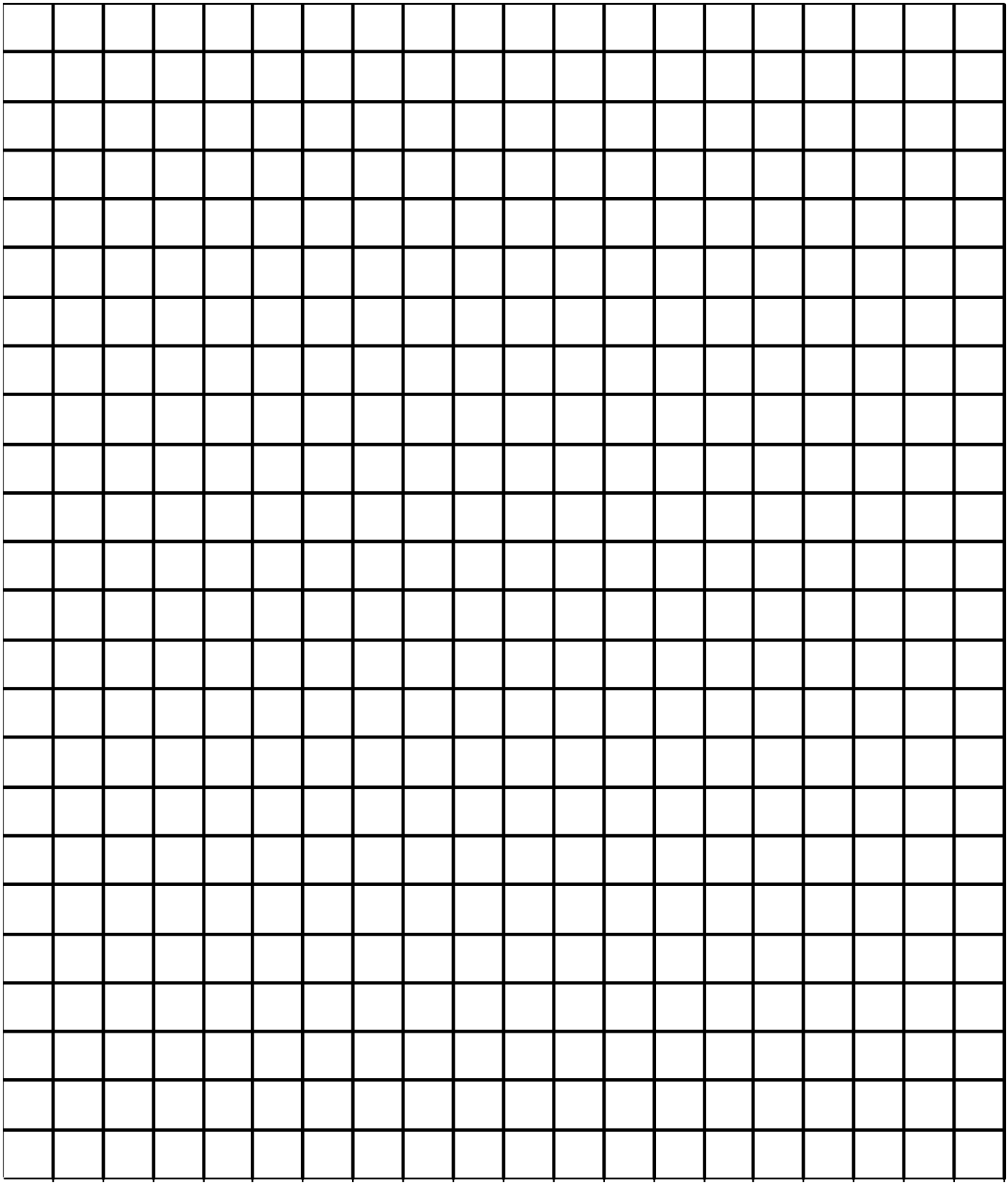
8. The perimeter of a square is 32 cm. Find the length of the diagonal.

9. Fill in the table. Each shape is regular, meaning all sides are equal. Side lengths and perimeter are expressed in "units".

Name	# of Sides	Side Length	Perimeter
Triangle	3	6	
	8	4	
Pentagon		7	
Heptagon			84
		12	48
	6		54
Decagon			72
		20	180

7-2 Area



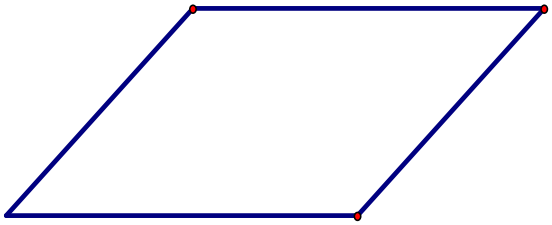


7-2 Area

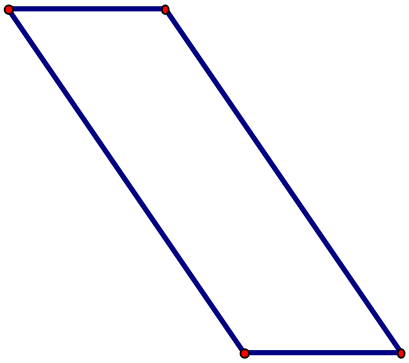
7-2 Area

1. For each triangle, draw the related parallelogram, which would have twice the area. For each parallelogram, draw the related rectangle, which would have the same area.

a)



b)



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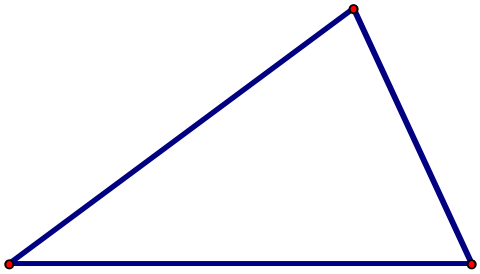
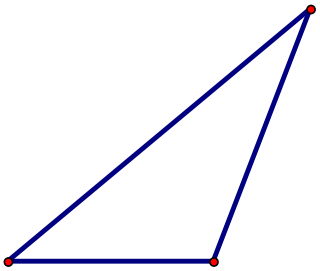
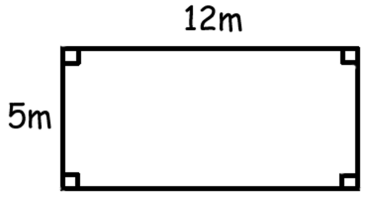


d)



2. Calculate the area of each shape. Make sure to include units.

a)



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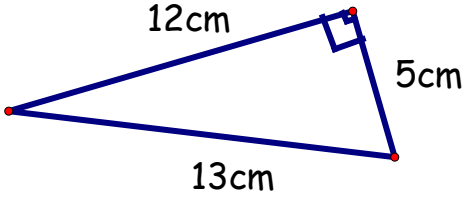

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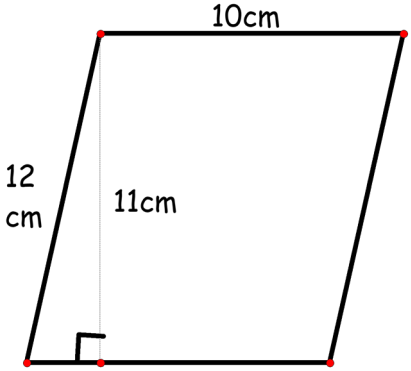

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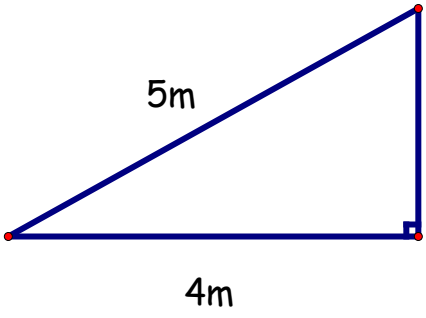

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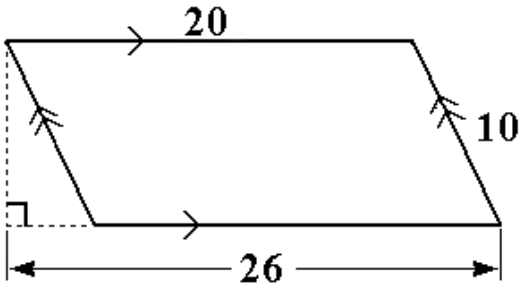

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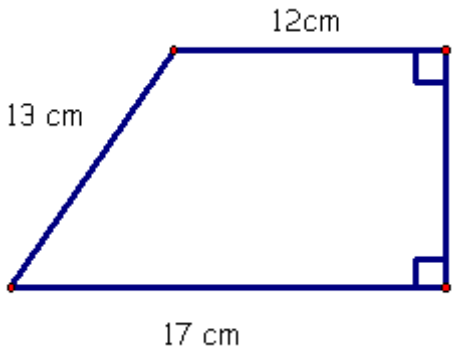

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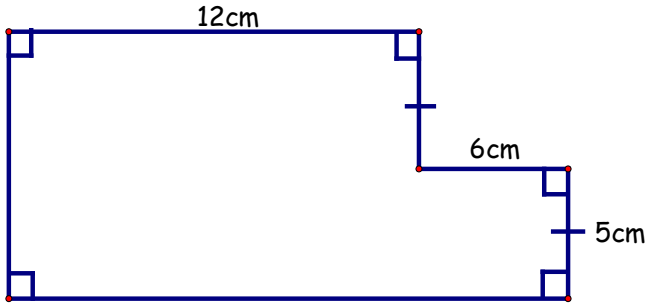

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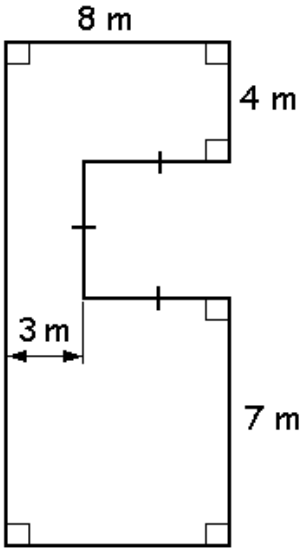
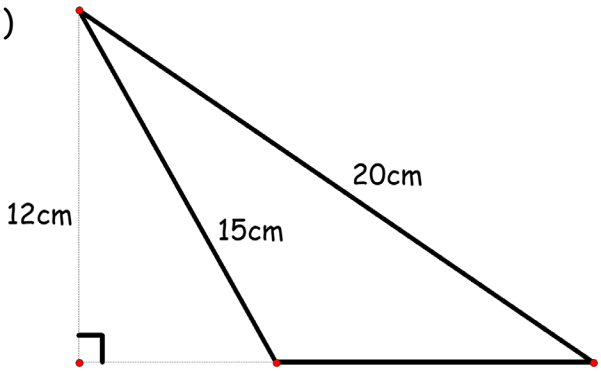


* i)



3. The area of a rectangle is 48 cm^2, if the base is 8 cm, what is the height?

4. The area of a triangle is 36 cm^2, if the height is 12 cm, how long is the base?

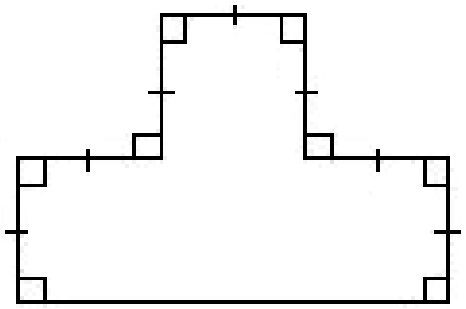
5. The area of a square is 64 cm^2, what is the perimeter?

6. The perimeter of a square is 36 cm, what is the area?

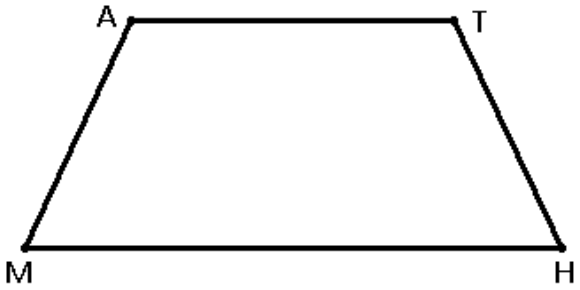
7. The sides of a rectangle are whole numbers, if the area of the rectangle is 36 cm^2:
a) What is the maximum perimeter possible? b) What is the minimum perimeter?

8. The perimeter of a rectangle is 66 m, and the base is 3 m longer than the height. What is the area of the rectangle?

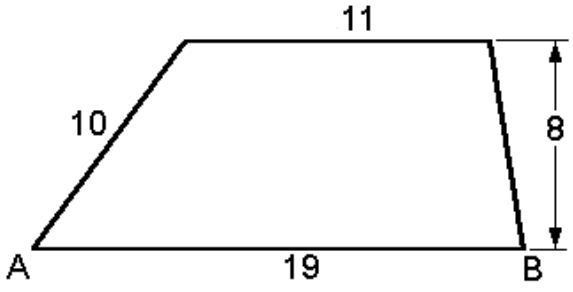
9. The area of the following figure is 196 in^2. Determine its perimeter.



10. Find the area of trapezoid MATH, if MA = 13 units, TH = MA, AT = 20 units, and MH = 30 units. Note: this is called an isosceles trapezoid. Why do you think that is?



11. Find the area of the following trapezoid.



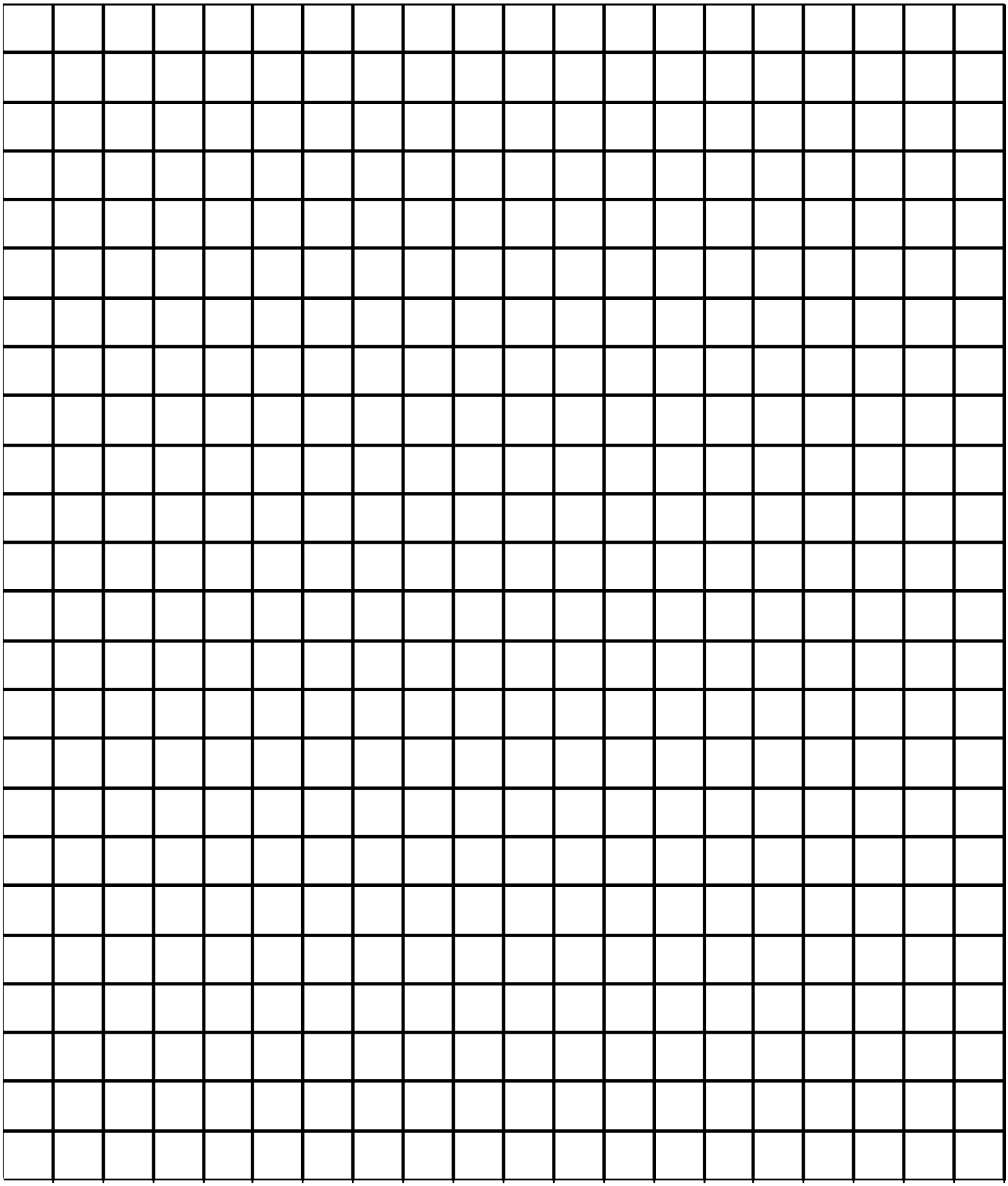
12. Petr has just graduated and got a job with College Pro Painters. His first job is to paint 2 rooms. The first room has two walls measuring 8 ft by 12 ft, and two walls measuring 8 ft by 9 ft. The second room has all four walls measuring 10 ft by 14 ft. One gallon of paint costs $32 and covers 400 ft^2. He needs to put two coats of paint on each wall. (Calculators can be used)

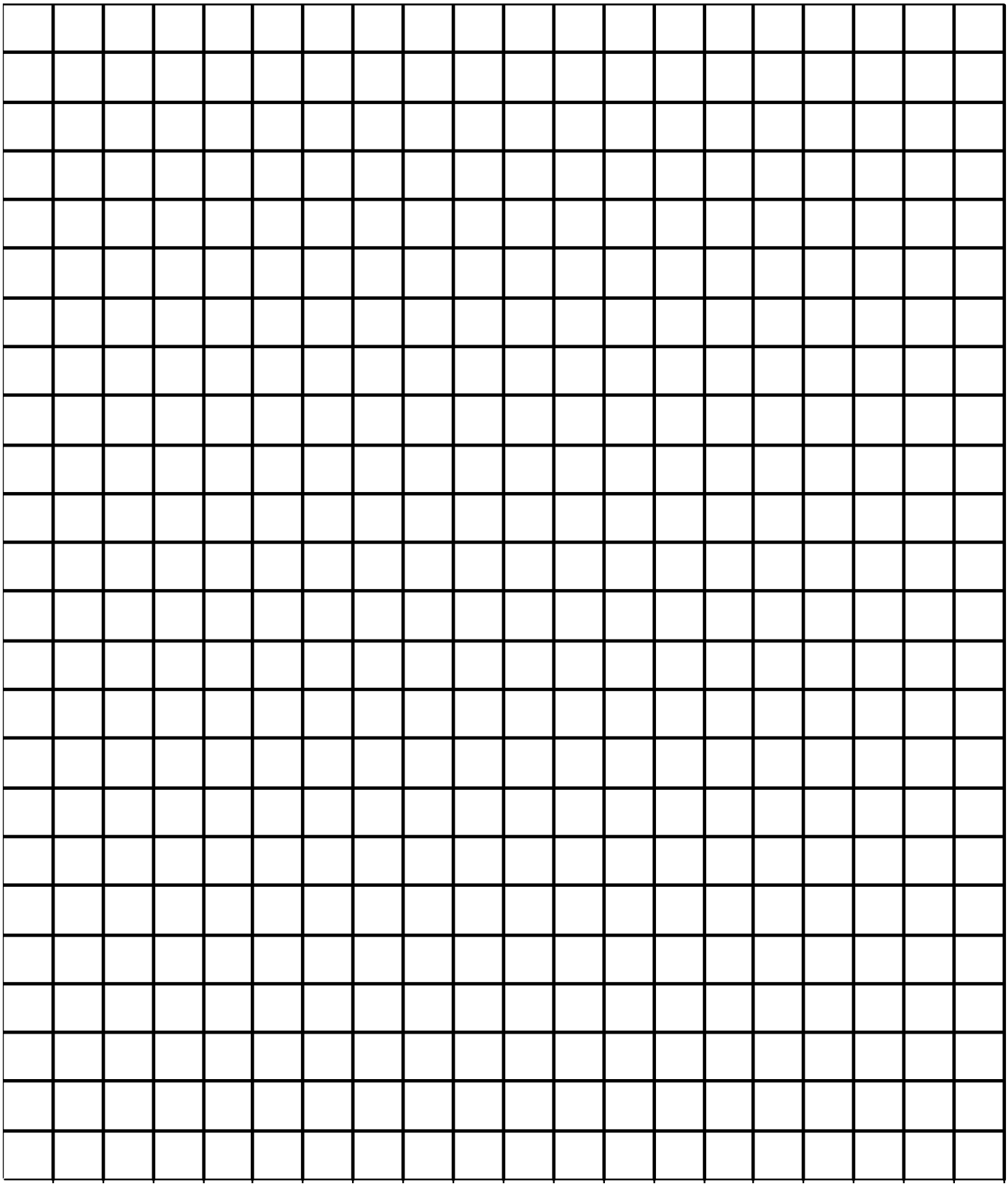
a) What is the total are that needs to be painted (include both coats)?

b) Realistically he can't buy fractions of a gallon of paint, so how much will he actually have to spend.

c) If he is given the option of buying gallons and/or quarts (one-quarter of a gallon, which cost $12). What is the least amount he will have to spend? Is it worth doing this? Discuss.

7-3 Circles: Area and Circumference





7-3 Circles: Area and Circumference

7-3 Circles: Area and Circumference

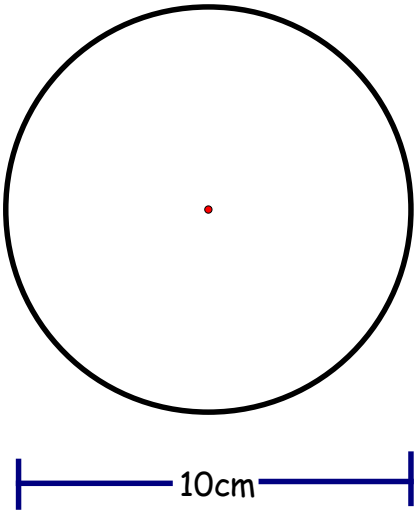
For all questions use the exact value of π, and then estimate the answer mentally using $\pi = 3$, or with the calculator using $\pi = 3.14$.

1. Determine the area and circumference for each of the following circles:

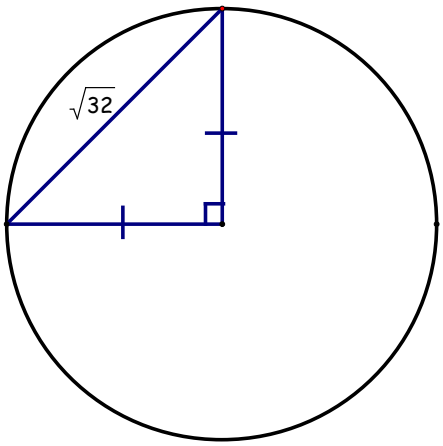
a) Radius = 10 cm

b) Diameter = 6 cm

c)



d)



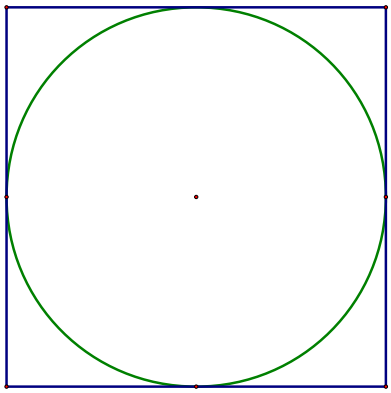
2. The circumference of a circle is 16π cm.

a) What is the radius?

b) What is the area?

3. The area of a circle is 16π cm^2. Find the circumference.

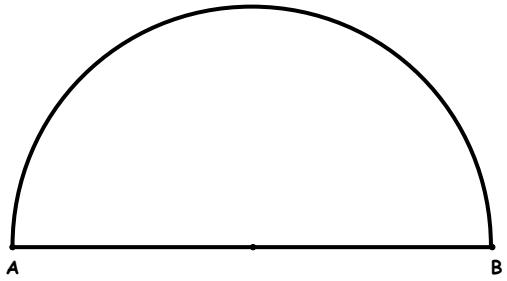
4. A circle is inscribed in a square as shown. If the area of the square is 100 cm^2, what is the area of the circle?



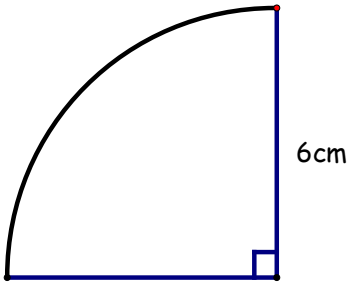
5. A circular pond has a radius of 30 m. It is estimated that there is one alligator in every 20 square meters of area. Based on this information, approximately how many alligators would you expect there to be in this pond?
(Use your calculator and $\pi = 3.14$)

6. Give the area and perimeter of each shape. Remember to give answer exactly (using π), then estimate it. When there is a shaded area, give the area of the shaded part.

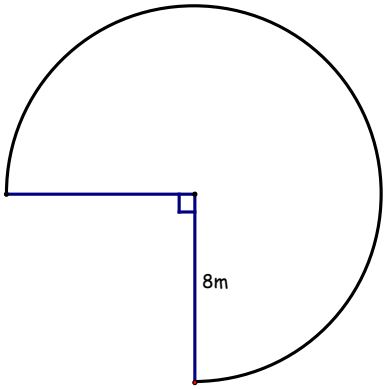
a) AB = 20 cm



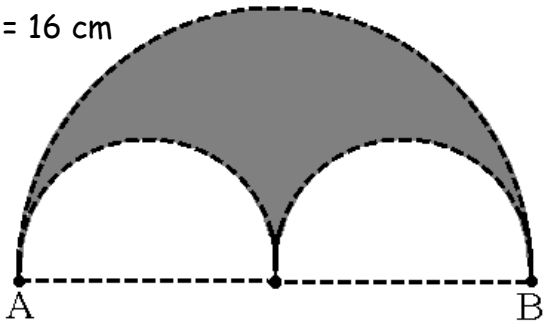
b)



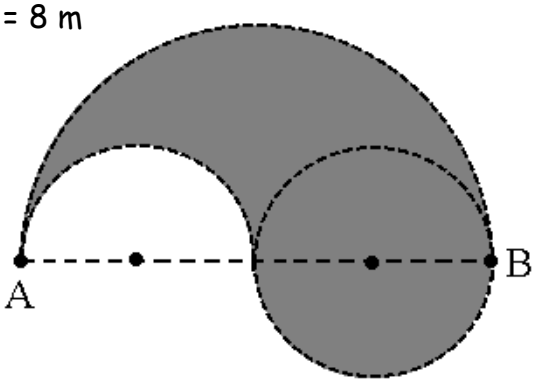
c)



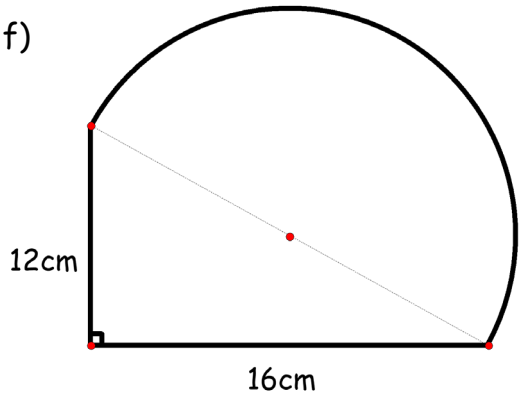
d) AB = 16 cm



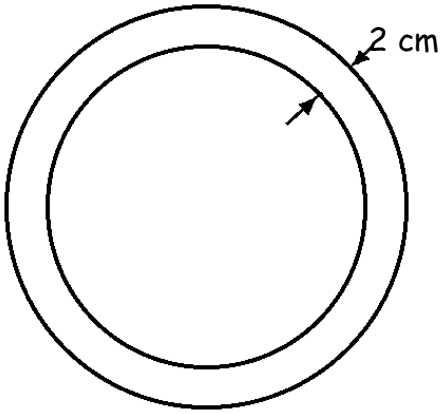
e) AB = 8 m



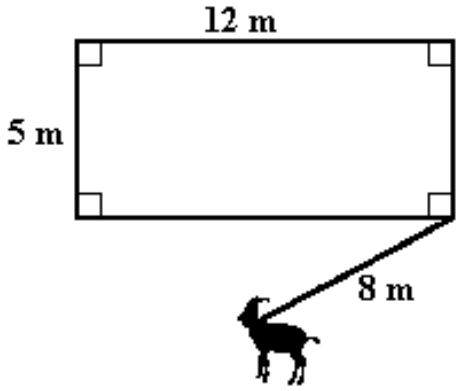
f)



g) The diameter of the outer circle is 16 cm, and there is 2 cm between the circles. Find area between the circles.



*7. Billy the Goat is tied to the corner of a 5 m by 12 m barn. If his rope is 8 m long, what is the total area of grass he can graze in? Give an exact answer or an approximate answer using $\pi = 3.14$

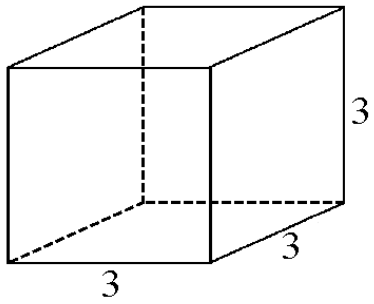


7-4 Nets (Flattened 3-D Shapes)

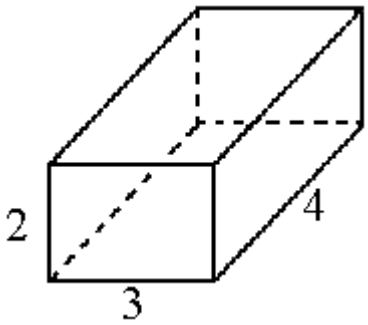
7-4 Nets (Flattened 3-D Shapes)

1. Draw the nets of the following objects:

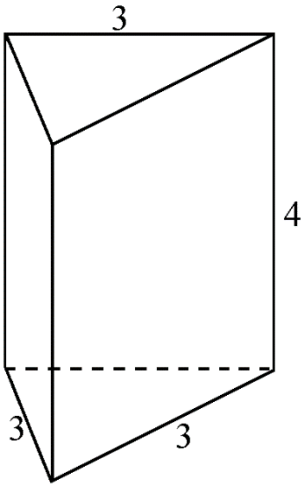
a)



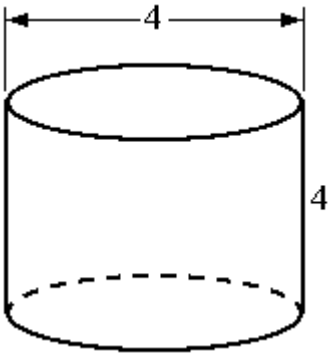
b)



c)



d)



7-5 Surface Area of Prisms and Cylinders

7-5 Surface Area of Prisms and Cylinders

1. Determine the surface areas of each solid from question 1 in section 7-4.

a)

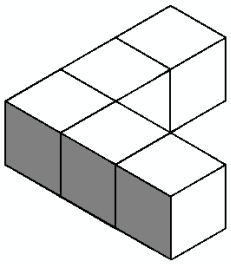
b)

c)

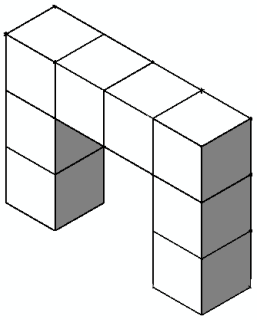
d)

2. Determine the surface areas of the following composite figures made of cubes. Each cube has sides of length one unit.

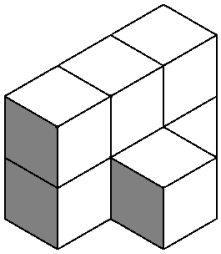
a)



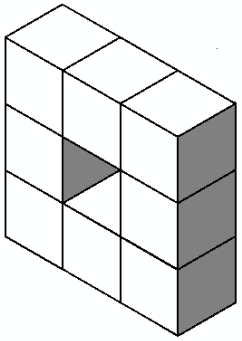
b)



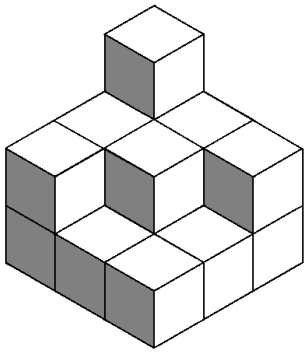
c)



d)

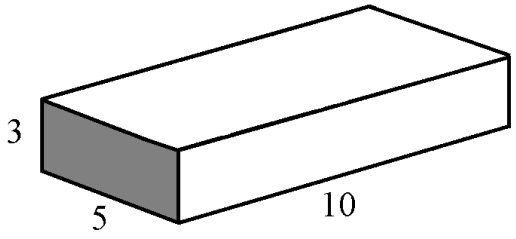


e)

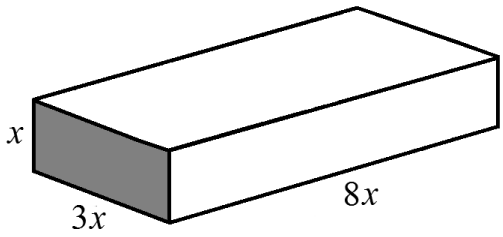


3. Determine the surface area of each of the following figures:

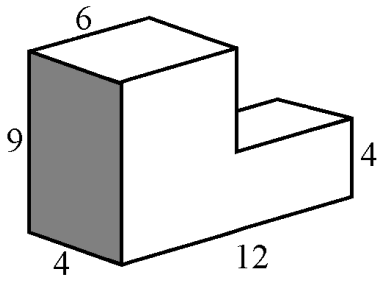
a)



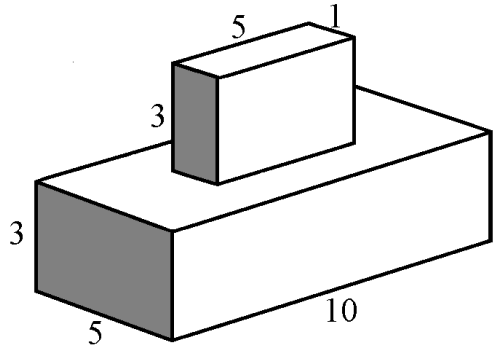
b)



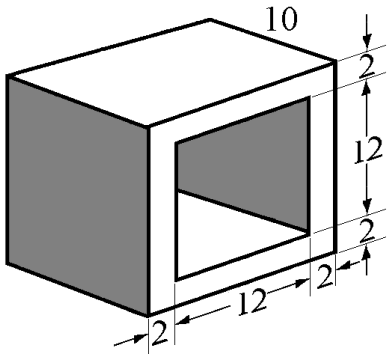
c)



d)

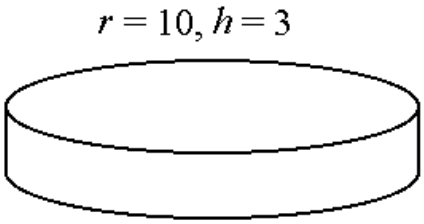


e)

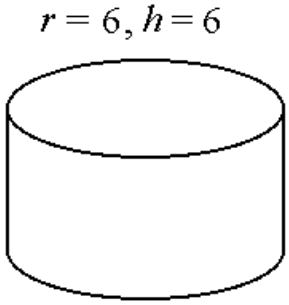


4. Determine the surface area of each of the following cylinders. Express your answers in terms of π.

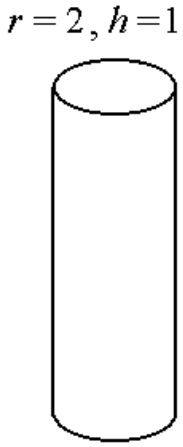
a)



b)

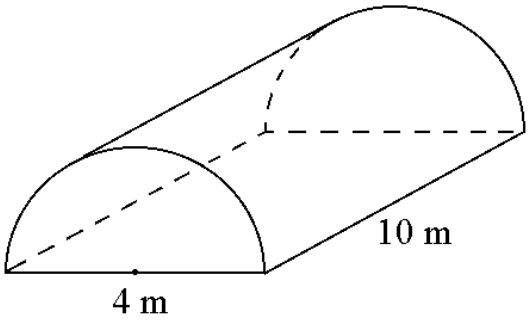


c)

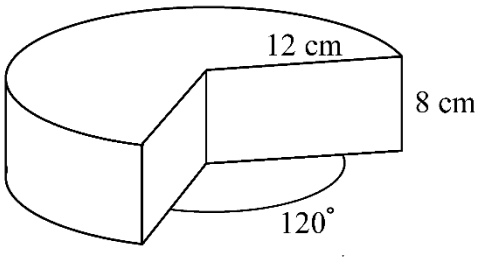


5. Determine the surface area of each of the following shapes. Express your answers in terms of π.

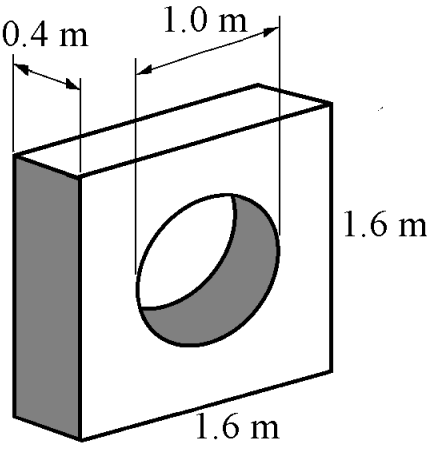
a)



b)



c)



6a). The length of a rectangular prism is three times its width and its height is one-half of its length. If the surface area of the prism is 882 square units, determine its dimensions.

b) The radius of a right cylinder is 4 cm and its total surface area is 72π cm^2. Determine its height.

7-6 Volume of Prisms and Cylinders

7-6 Volume of Prisms and Cylinders

1. Determine the volume of each shape from question 1 in section 7-4

a)

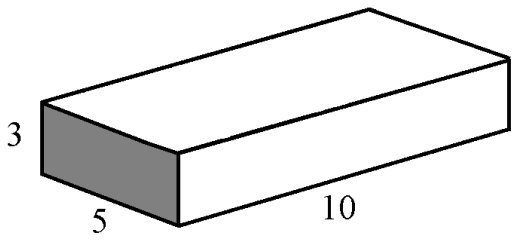
b)

c)

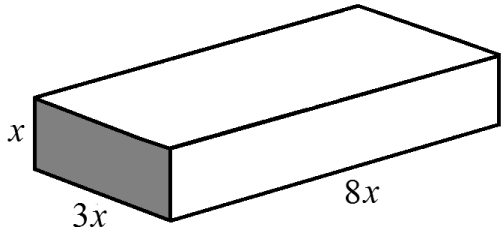
d)

2. Determine the volume of each of the following figures:

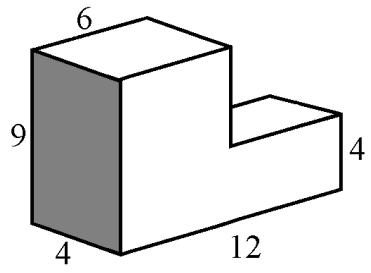
a)



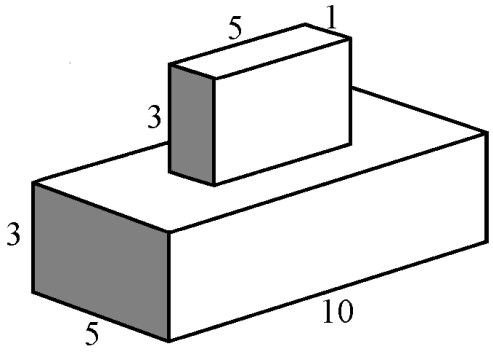
b)



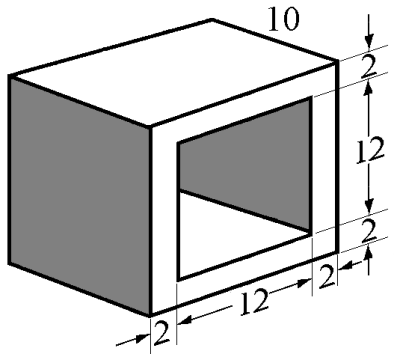
c)



d)

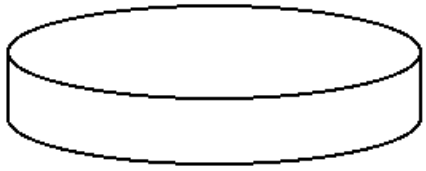


e)

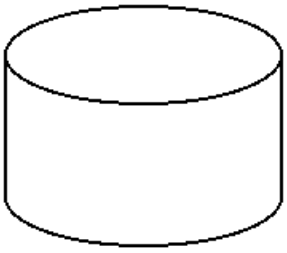


3. Determine the volume of each of the following cylinders. Express your answers in terms of π.

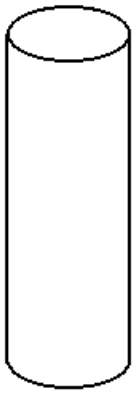
a) $r = 10, h = 3$



b) $r = 6, h = 6$

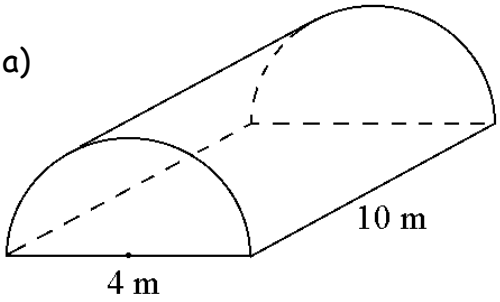


c) $r = 2, h = 12$

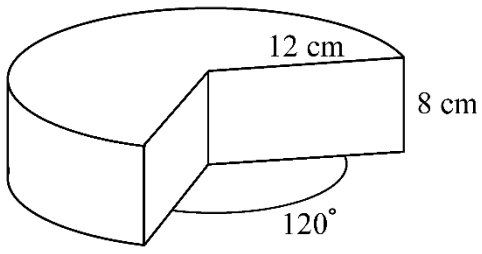


4. Determine the volume of each of the following shapes. Express your answers in terms of π.

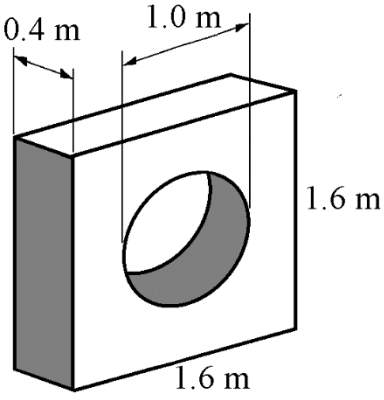
a)



b)



c)



5. Given two cylindrical cans A and B, sketch the following situations and answer the question:

a) The height and radius of can B are both twice the height and radius of can A.

i) How many times greater is the volume of can B than can A?

ii) How many times greater is the surface area of can B than can A?

b) The height of can B is one-half of the height of can A, and the radius of can B is twice the radius of can A. What is the relationship of the volume of can B to can A?

c) The height of can B is twice the height of can A, and the radius of can B is one-half the radius of can A. What is the relationship of the volume of can B to can A?