POLICE OFFICER PREPARATION MATERIALS

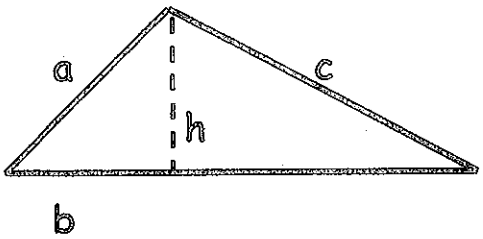
6

Additional Math Information

To measure the distance around a room, the volume of a container, or any other quantity pertaining to a particular geometrical form, you need to know the formulas for determining the perimeter or circumference, area, and volume of a triangle, rectangle, or circle

Shape:

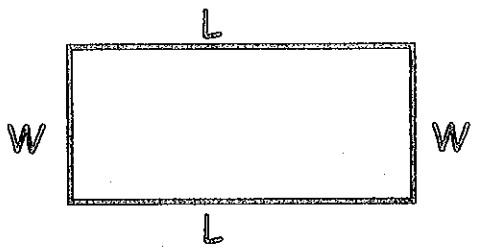
TRIANGLE



$P = a + b + c$

$A = \frac{1}{2} \times h \times b$

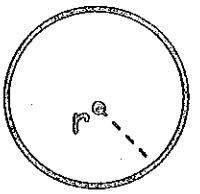
RECTANGLE



$P = L + W + L + W$

$A = L \times W$

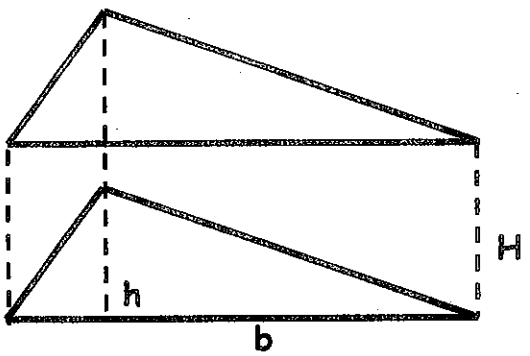
CIRCLE



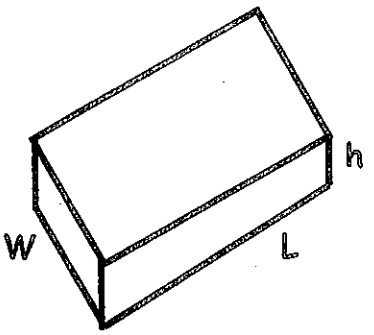
$C = 2\pi r$

$A = \pi r^2 = \pi \times r \times r$

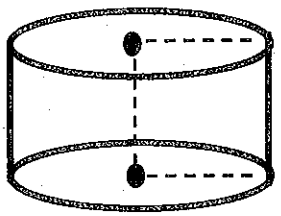
(Note: $\pi = 3.1416$)



$V = \frac{1}{2} \times h \times b \times H$



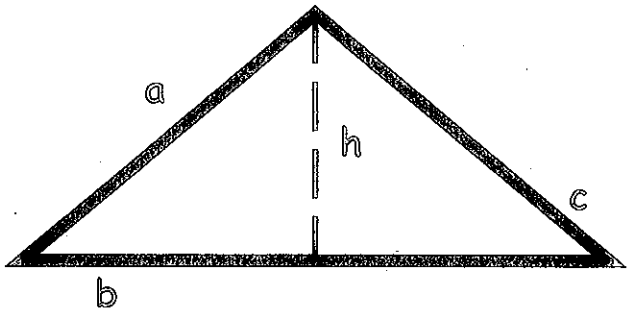
$V = L \times W \times h$



$V = \pi r^2 h$

A = Area (the amount of surface)
C = Circumference (the outer boundary of a circle)
H = Height (h also = height)
L = Length (the linear measurement of anything from end to end)
P = Perimeter (the circumference, border, or outer boundary of a two-dimensional figure)
V = Volume (the size, measure, or amount of anything in three dimensions)
W = Width (distance from side to side)

Mathematics Problems.



Use the triangle above to answer questions 1 through 4.

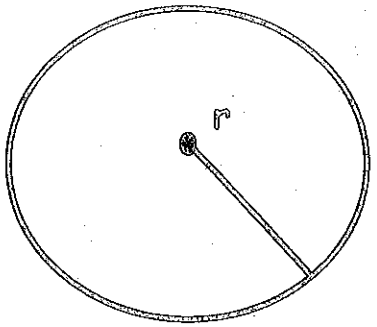
1. The triangle above has a base of 35 feet and a height of 9 feet, what is the area of the triangle?
   a. 155.5 square feet.
   b. 150.5 square feet.
   c. 157.5 square feet.
   d. 156.5 square feet.

2. If the base of the triangle above is 20 feet and the height is 3.5 feet, what is the area?
   a. 20 square feet.
   b. 25 square feet.
   c. 30 square feet.
   d. 35 square feet.

3. If the base of the triangle is 8 feet, the height is 5 feet and the sides are 10 feet, what is the perimeter of the triangle?
   a. 20 feet,
   b. 28 feet.
   c. 36 feet.
   d. 40 feet.

4. If the base of the triangle is 10 feet, the height is 5 feet and the sides are 15 feet, what is the perimeter of the triangle?
   a. 25 feet.
   b. 30 feet.
   c. 35 feet.
   d. 40 feet.

Use the Circle shown below to answer questions 5 through 8.



5. What is the area of the circle above, if the radius equals 10 feet?

   a. 100 feet
   b. 214.0 feet
   c. 314.16 feet
   d. 350.0 feet

6. What is the area of the circle above, if the radius equals 37.59 feet? (Round your answer to the nearest one hundredths.)

   a. 4,209.00 feet
   b. 4,039.11 feet
   c. 3,709.11 feet
   d. 4,439.11 feet

7. The circle above has a radius of 25 feet. What is the circumference of the circle?

   a. 100.0 feet
   b. 157.08 feet
   c. 314.16 feet
   d. 357.09 feet

8. The circle above has a radius of 17 feet. What is the circumference of the circle?

   a. 106.81 feet
   b. 125.09 feet
   c. 131.16 feet
   d. 157.00 feet

9. How many feet of rope will be needed to secure a protective barrier around a hazardous building that is 35 feet wide by 45 feet long?

   a. 100 feet
   b. 160 feet
   c. 200 feet
   d. 400 feet

10. How many cubic feet of water will a tank on the back of a truck hold that is 10 feet wide, 15 feet long and 4 feet high?

    a. 600 ft^3
    b. 650 ft^3
    c. 700 ft^3
    d. 750 ft^3

11. A Fire pumper that a holding tank that is 8 feet long, 5 feet wide and 7 $\frac{1}{2}$ feet high. How many cubic feet of water will this tank hold?

    a. 100 ft^3
    b. 150 ft^3
    c. 200 ft^3
    d. 300 ft^3

12. A room has an area of 150 square feet. If it is 24 feet long, what size salvage cover will be needed to protect the floor?

    a. 5.50 ft
    b. 6.25 ft
    c. 7.00 ft
    d. 10.05 ft

Math Problems Answers

1. c

$A = \frac{1}{2} \times h \times b$
$A = \frac{1}{2} (9) (35)$
$A = (4.5) (35)$
$A = 157.5$ square feet

2. d

$A = \frac{1}{2} \times h \times b$
$A = \frac{1}{2} (3.5) (20)$
$A = (1.75) (20)$
$A = 35$ square feet

3. b

$P = a + b + c$
$P = 10 + 8 + 10$
$P = 28$

4. d

$P = a + b + c$
$P = 15 + 10 + 15$
$P = 40$

5. c

$A = \pi^2$
$A = \pi \times r \times r$
$A = (3.1416) (10) (10)$
$A = 314.16$

6. d

$A = \pi^2$
$A = \pi \times r \times r$
$A = (3.1416) (37.59) (37.59)$
$A = 4,439.11$

7. b

$C = 2\pi r$
$C = 2 \times \pi \times r$
$A = (2) (3.1416) (25)$
$A = 157.08$

8. a

$C = 2\pi r$
$C = 2 \times \pi \times r$
$A = (2) (3.1416) (17)$
$A = 106.81$

9. b

$P = L + W + L + W$
$P = 45 + 35 + 45 + 35$
$P = 160$ feet of rope.

10. a

$V = L \times W \times h$

$V = (15)(10)(4)$

$V = 600\ ft^3$

11. d

$V = L \times W \times h$

$V = (8)(5)(7\ \frac{1}{2})$

$V = 300\ ft^3$

12. b

$A = L \times W$

$150\ ft^2 = 24\ ft \times W$

$\frac{150\ ft^2}{24\ ft} = W$

$6.25\ ft = W$