

## **Zero The Math Hero**

### **Standard Mathematical Elements - Lesson 10**

Lesson 10 defines perimeter, circumference, and area of 2-dimensional figures. Several formulas for perimeter and area are used for different shapes, such as:

- rectangles
- squares
- triangles
- parallelograms
- circles

In Lesson 10, the meanings of perimeter, circumference, and area are discussed in detail. The concept of the number pi is also represented with different approximations. Many examples of finding perimeter and area are worked by using formulas. Also, problems finding arc length and the area of a sector of a circle are shown. Students will find the area of a composite figure as well.

## Zero the Math Hero – Lesson 10

### Lesson 10 – Definitions

**perimeter** - the distance around a closed plane figure

**circumference** - the distance around a circle

**area** - the number of square units needed to fill a plane figure

**altitude** - for a triangle, the perpendicular segment from a vertex to the line that contains the opposite side

**pi** - the number that represents a circle's circumference divided by its diameter. It is an irrational number that is approximately 3.14. (Symbol for pi is:  $\pi$ )

### Lesson 10 – Formulas

$P = 2(l + w)$  or  $P = 2l + 2w$  (perimeter of a rectangle)

$P = 4s$  (perimeter of a square)

$P = a + b + c$  (perimeter of a triangle)

$C = \pi d$  or  $C = 2\pi r$  (circumference of a circle)

$A = bh$  or  $A = lw$  (area of a rectangle)

$A = bh$  (area of a parallelogram)

$A = s^2$  (area of a square)

$A = \frac{1}{2}bh$  (area of a triangle)

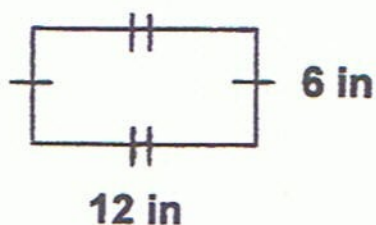
$A = \pi r^2$  (area of a circle)

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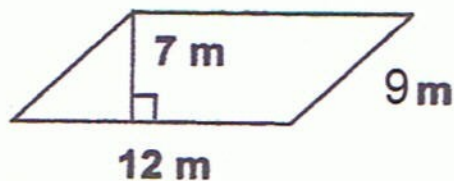
**Lesson 10 - Practice Problems**  
Perimeter, Circumference, and Area

1. Find the perimeter **and** the area.



1.  $P =$  \_\_\_\_\_  $A =$  \_\_\_\_\_

3. Find the perimeter **and** the area.

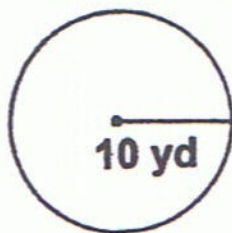


3.  $P =$  \_\_\_\_\_  $A =$  \_\_\_\_\_

5. Which is **not** an approximation for pi?  
A. 3.14 B.  $22/7$  C. 1.618 D. 3.141592654

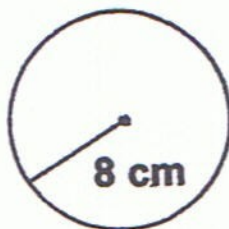
5. \_\_\_\_\_

2. Find the circumference in terms of pi.



2.  $C =$  \_\_\_\_\_

4. Find the area in terms of pi.



4.  $A =$  \_\_\_\_\_

6. Find the circumference **and** the area to the tenths.



6.  $C \approx$  \_\_\_\_\_  $A \approx$  \_\_\_\_\_

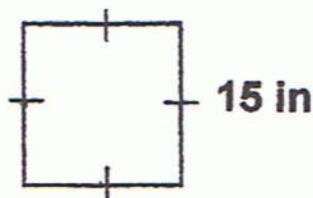
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### Lesson 10 - Practice Problems - Continued

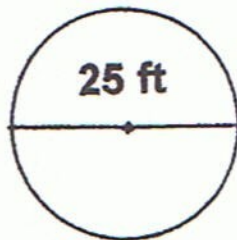
Perimeter, Circumference, and Area

7. Find the perimeter and the area.



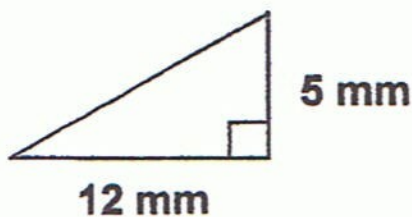
7.  $P =$  \_\_\_\_\_  $A =$  \_\_\_\_\_

8. Find the circumference in terms of pi.



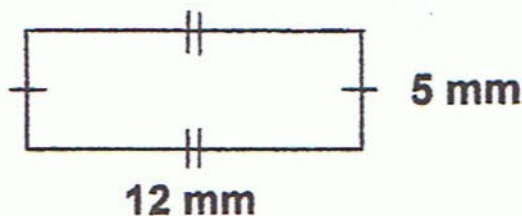
8.  $C =$  \_\_\_\_\_

9. Find the perimeter and the area.



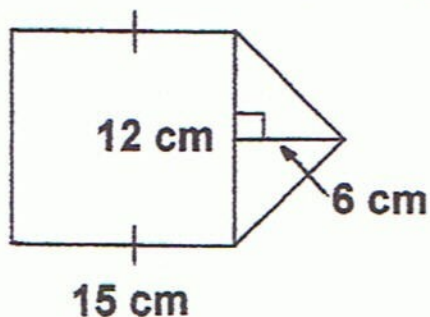
9.  $P =$  \_\_\_\_\_  $A =$  \_\_\_\_\_

10. Find the perimeter and the area.



10.  $P =$  \_\_\_\_\_  $A =$  \_\_\_\_\_

11. Find the area of the composite figure.



11.  $A =$  \_\_\_\_\_

12. Find the circumference and the area to the tenths.



12.  $C \approx$  \_\_\_\_\_  $A \approx$  \_\_\_\_\_



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Quiz - Terms and Formulas

Zero the Math Hero – Lesson 10

### Lesson 10 – Terms and Formulas

Directions: Fill in each blank with the letter that corresponds to the correct answer, A-E.

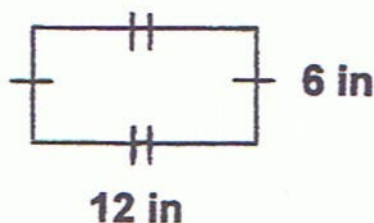
- \_\_\_\_\_ the number that represents a circle's circumference divided by its diameter. It is an irrational number that is approximately 3.14. A. area
- \_\_\_\_\_ the distance around a closed plane figure B. altitude
- \_\_\_\_\_ the distance around a circle C. circumference
- \_\_\_\_\_ for a triangle, the perpendicular segment from a vertex to the line that contains the opposite side D. perimeter
- \_\_\_\_\_ the number of square units needed to fill a plane figure E. pi ( $\pi$ )

Directions: Fill in each blank with the letter that corresponds to the correct answer, F-M.

- \_\_\_\_\_  $A = bh$  or  $A = lw$  F. perimeter of a rectangle
- \_\_\_\_\_  $A = \frac{1}{2}bh$  G. perimeter of a square
- \_\_\_\_\_  $C = \pi d$  or  $C = 2\pi r$  H. perimeter of a triangle
- \_\_\_\_\_  $P = 4s$  I. circumference of a circle
- \_\_\_\_\_  $P = 2(l + w)$  or  $P = 2l + 2w$  J. area of a rectangle
- \_\_\_\_\_  $A = \pi r^2$  K. area of a square
- \_\_\_\_\_  $A = s^2$  L. area of a triangle
- \_\_\_\_\_  $P = a + b + c$  M. area of a circle

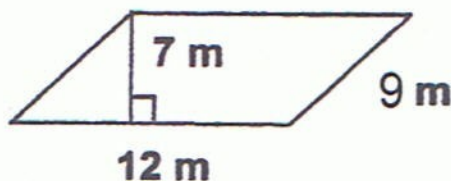
**Lesson 10 - Practice Problems**  
Perimeter, Circumference, and Area

1. Find the perimeter
- and
- the area.



1.  $P = 36 \text{ in}$      $A = 72 \text{ in}^2$

3. Find the perimeter
- and
- the area.

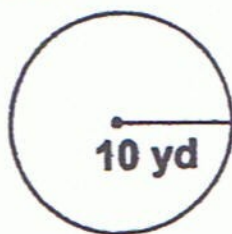


3.  $P = 40 \text{ m}$      $A = 84 \text{ m}^2$

5. Which is
- not
- an approximation for pi?
- 
- A. 3.14    B.
- $22/7$
- C. 1.618    D. 3.141592654

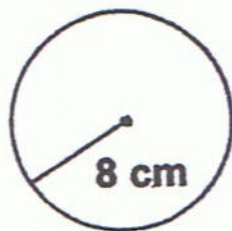
5. C (1.618)

2. Find the circumference in terms of pi.



2.  $C = 20\pi \text{ yd}$

4. Find the area in terms of pi.



4.  $A = 64\pi \text{ cm}^2$

6. Find the circumference
- and
- the area to the tenths.

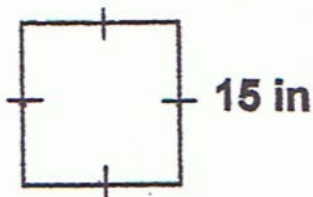


6.  $C \approx 44.0 \text{ mi}$      $A \approx 153.9 \text{ mi}^2$

### Lesson 10 - Practice Problems - Continued

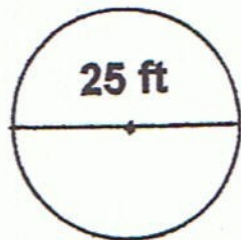
Perimeter, Circumference, and Area

7. Find the perimeter
- and
- the area.



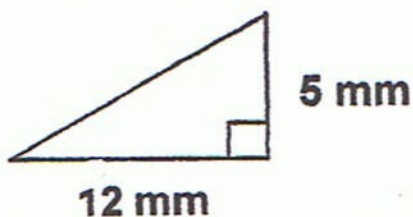
7.  $P = 60 \text{ in}$      $A = 225 \text{ in}^2$

8. Find the circumference in terms of pi.



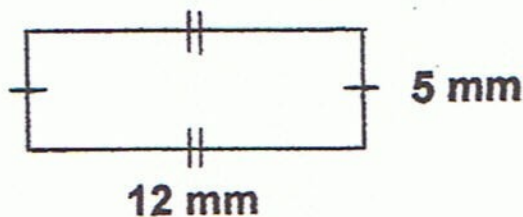
8.  $C = 25\pi \text{ ft}$

9. Find the perimeter
- and
- the area.



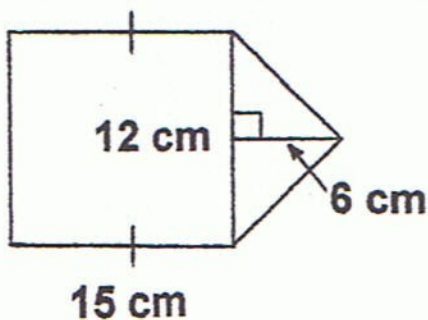
9.  $P = 30 \text{ mm}$      $A = 30 \text{ mm}^2$

10. Find the perimeter
- and
- the area.



10.  $P = 34 \text{ mm}$      $A = 60 \text{ mm}^2$

11. Find the area of the composite figure.



11.  $A = 216 \text{ cm}^2$

12. Find the circumference
- and
- the area to the tenths.



12.  $C \approx 28.9 \text{ km}$      $A \approx 66.4 \text{ km}^2$

Name: ANSWER KEY

Date: \_\_\_\_\_

## Quiz - Terms and Formulas

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### Lesson 10 - Terms and Formulas

Directions: Fill in each blank with the letter that corresponds to the correct answer, A-E.

- E the number that represents a circle's circumference divided by its diameter. It is an irrational number that is approximately 3.14.      A. area  
B. altitude
- D the distance around a closed plane figure      C. circumference
- C the distance around a circle      D. perimeter
- B for a triangle, the perpendicular segment from a vertex to the line that contains the opposite side      E. pi ( $\pi$ )
- A the number of square units needed to fill a plane figure

Directions: Fill in each blank with the letter that corresponds to the correct answer, F-M.

- J  $A = bh$  or  $A = lw$       F. perimeter of a rectangle
- L  $A = \frac{1}{2}bh$       G. perimeter of a square
- I  $C = \pi d$  or  $C = 2\pi r$       H. perimeter of a triangle
- G  $P = 4s$       I. circumference of a circle
- F  $P = 2(l + w)$  or  $P = 2l + 2w$       J. area of a rectangle
- M  $A = \pi r^2$       K. area of a square
- K  $A = s^2$       L. area of a triangle
- H  $P = a + b + c$       M. area of a circle