

# CM SAMPLE

P 9-3

NAME \_\_\_\_\_

PYTHAGOREAN DIVISION

MEET 3

JANUARY 8, 2015

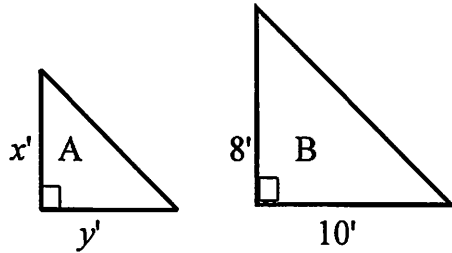
GRADE 9

30 MINUTES

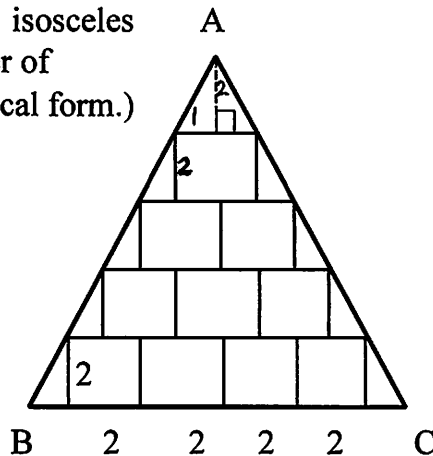
ANSWER COLUMN

Directions: Place your answer to each question below in the answer column.

- 1) If  $\langle a, b, c \rangle$  means  $(a - b) - (a - c) - (b + c)$ , then  $\langle x, 8, y \rangle =$  \_\_\_\_\_ in simplest form.
- 2) Find the sum of the first 8 digits to the right of the decimal point in the decimal representation of  $\frac{25}{99}$ .
- 3) If  $3^x = a$ , express  $3^{2x+1}$  in terms of  $a$ .
- 4) The positive number \_\_\_\_\_ is equal to four-fifths of the sum of the number and its reciprocal.
- 5)  $\Delta A \sim \Delta B$ . The area of  $\Delta A = 20$  sq. ft. Find  $x$  and  $y$  in simplest radical form.



- 6) A stack of 2" squares are placed inside an isosceles triangle ( $AB \cong AC$ ), as shown. The perimeter of  $\Delta ABC$  is \_\_\_\_\_". (Leave your answer in radical form.)



1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

4) \_\_\_\_\_

5) \_\_\_\_\_

6) \_\_\_\_\_

The answer to each question is in parentheses at the beginning of each solution.

- 1) (-16)       $\langle x, 8, y \rangle = (x - 8) - (x - y) - (8 + y) = -16.$
- 2) (28)       $2\frac{5}{99} = .25$ . The 1<sup>st</sup> 8 digits to the right of the decimal point are 2 and 5 four times.  
 $(2 + 5) \times 4 = 28.$
- 3)  $(3a^2)$        $3^{2x+1} = 3 \cdot 3^{2x} = 3 \cdot (3^x)^2 = 3a^2.$
- 4) (2)       $x = \frac{4}{5}(x + \frac{1}{x}) = \frac{4}{5}x + \frac{4}{5x}$ .     $\frac{1}{5}x = \frac{4}{5x}$ ;  $x = \frac{4}{x}$ ;  $x^2 = 4$ ;  $x = 2.$
- 5)  $\begin{pmatrix} x = 4\sqrt{2} \\ y = 5\sqrt{2} \end{pmatrix}$       The area of  $\Delta B = \frac{1}{2}(8')(10') = 40$  sq. ft.  
 $\frac{\text{area } \Delta A}{\text{area } \Delta B} = \frac{20}{40} = \frac{1}{2}$ .     $\frac{\text{side of } \Delta A}{\text{side of } \Delta B} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}.$

$$\frac{x}{8} = \frac{\sqrt{2}}{2}; x = 4\sqrt{2}. \quad \frac{y}{10} = \frac{\sqrt{2}}{2}; y = 5\sqrt{2}.$$

- 6)  $(10 + 10\sqrt{5})$  By the Pythagorean Theorem,  
 each of the 5 sections of side  
 $AB = \sqrt{5}$ .  $AB = 5\sqrt{5}$ ,  $BC = 10$ .  
 $P = 10 + 10\sqrt{5}$ .

