

**BROWNSVILLE CITY MATH MEET  
JAMES PACE HIGH SCHOOL**

**MAY 8, 2008**



**GEOMETRY**

NAME \_\_\_\_\_

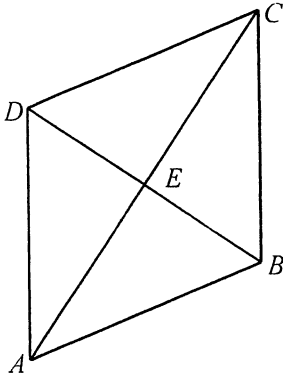
SCHOOL \_\_\_\_\_

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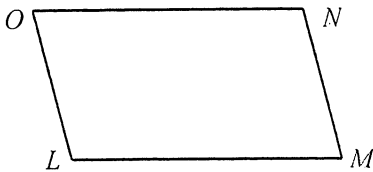


5. Given  $ABCD$  is a rhombus,  $m\angle DAC = 30$ , and  $DE = 14$ . Find the length of  $\overline{AB}$ .



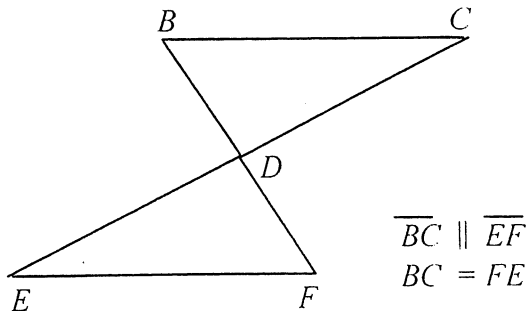
- [A] 33                      [B] 28                      [C] 32                      [D] 25

6. If  $ON = 3x - 4$ ,  $LM = 9x + 7$ ,  $NM = x + 4$ , and  $OL = 9y + 3$ , find the values of  $x$  and  $y$  for which  $LMNO$  must be a parallelogram.



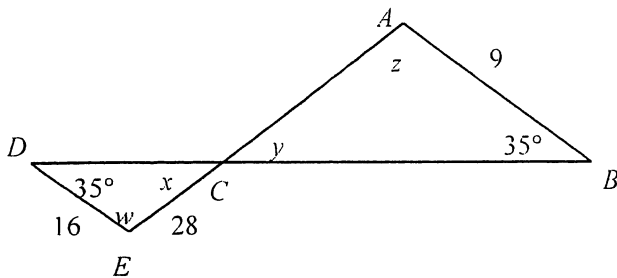
- [A]  $x = -\frac{11}{6}; y = \frac{54}{5}$                       [B]  $x = -\frac{1}{2}; y = \frac{1}{18}$   
 [C]  $x = 2; y = \frac{54}{5}$                       [D]  $x = -\frac{11}{6}; y = -\frac{5}{54}$

7. Refer to the figure shown. Which of the following statements is true?

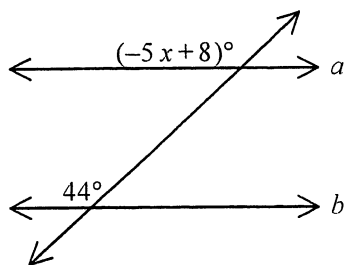


- [A]  $\triangle BCD \cong \triangle FED$  by ASA.                      [B]  $\triangle BCD \cong \triangle DFE$  by SAS.  
 [C]  $\triangle BCD \cong \triangle DFE$  by ASA.                      [D]  $\triangle BCD \cong \triangle EFD$  by ASA.

8. Find the converse of "If it is a shovel, then it is a tool."  
 [A] If it is a tool, then it is not a shovel. [B] If it is a tool, then it is a shovel.  
 [C] If it is not a shovel, then it is not a tool. [D] If it is a shovel, then it is not a tool.
9. Which statement is true for the triangles shown below?



- [A]  $m\angle x = 35$  [B]  $AC = 15.8$  [C]  $m\angle z \neq m\angle w$  [D]  $\frac{CE}{CA} = \frac{CB}{CD}$
10. What must be the value of  $x$  for  $a$  to be parallel to  $b$ ?

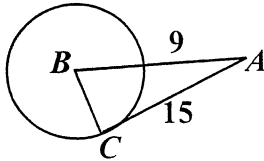


- [A]  $-\frac{52}{5}$  [B]  $-\frac{36}{5}$  [C]  $-\frac{5}{36}$  [D]  $-\frac{5}{52}$
11. The area of a circle is  $36\pi$  and its center is at  $(5, -1)$ . What is its equation?  
 [A]  $x^2 + y^2 = 6$  [B]  $(x - 5)^2 + (y + 1)^2 = 36$   
 [C]  $(x + 5)^2 + (y - 1)^2 = 6$  [D]  $(x - 5)^2 + (y + 1)^2 = 6$  [E] none of the above
12. The inside of an ice cream cone has radius 4 cm and height 7 cm. Assuming that a half-scoop of ice cream is in the shape of a hemisphere, and that it fits perfectly on top of the cone (same radius), find the total volume of ice cream. Use 3.14 for  $\pi$  and round your answer to the nearest tenth.  
 [A]  $485.7 \text{ cm}^3$  [B]  $227.9 \text{ cm}^3$  [C]  $251.2 \text{ cm}^3$  [D]  $385.2 \text{ cm}^3$

13.  $\triangle JKL$  has vertices  $J(0, 0)$ ,  $K(1, 0)$ ,  $L(0, 9)$ . Find the equations of the lines that contain the three altitudes.

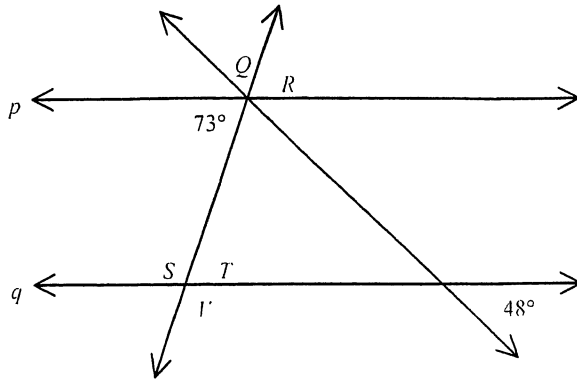
[A]  $x = 0, y = 0, y = 9x$                       [B]  $x = 0, y = 0, y = \frac{1}{9}x$   
 [C]  $x = 1, y = 9, y = \frac{1}{9}x$                       [D]  $x = 9, y = 1, y = 9x$

14. Find  $m\angle A$ .



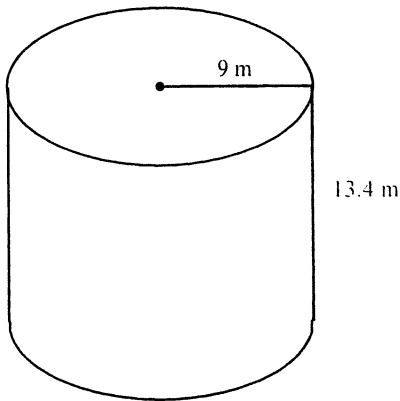
- [A] 62            [B] 28            [C] 47            [D] 90            [E] none of the above
15. Which pairs of quadrilaterals are congruent?  
 I. two squares whose corresponding diagonals are congruent  
 II. two rectangles whose corresponding diagonals are congruent  
 III. two rhombuses whose corresponding diagonals are congruent  
 [A] II only    [B] I and II    [C] I only    [D] I, II, and III    [E] I and III
16. To find the height of a pole, a surveyor moves 190 feet away from the base of the pole and then, with a transit 3 feet tall, measures the angle of elevation to the top of the pole to be  $50^\circ$ . What is the height of the pole? Round answer to the nearest foot.  
 [A] 229 ft            [B] 162 ft            [C] 159 ft            [D] 226 ft
17. A park maintenance person stands 24 m from a circular monument. If you assume her lines of sight form tangents to the monument and make an angle of  $25^\circ$ , what is the measure of the arc of the monument that her lines of sight intersect?  
 [A] 115            [B] 155            [C] 130            [D] 65

18. Which statement is true for the figure below, given that  $p$  and  $q$  are parallel lines?



- [A] Since  $m\angle T = 73$ ,  $m\angle Q = 59$
- [B] Since  $m\angle T = 73$ ,  $m\angle S = 117$
- [C]  $m\angle V = m\angle R$
- [D] None of these statements is true.

19. Find the surface area of the cylinder to the nearest square unit. (Use  $\pi = 3.14$ )



- [A]  $1266 \text{ m}^2$
- [B]  $121 \text{ m}^2$
- [C]  $202 \text{ m}^2$
- [D]  $633 \text{ m}^2$

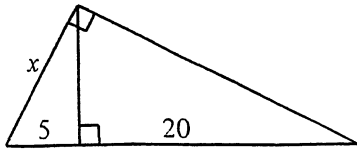
20. Find the area of an equilateral triangle with an apothem 5.5 feet long and a side 19 feet long.

- [A]  $156.75 \text{ ft}^2$
- [B]  $78.375 \text{ ft}^2$
- [C]  $104.5 \text{ ft}^2$
- [D]  $313.5 \text{ ft}^2$

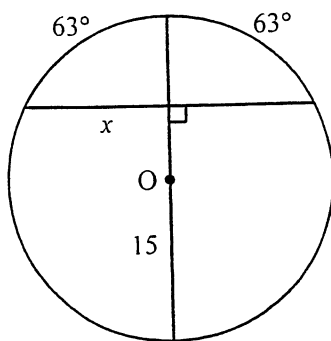
21. A gardener needs to cultivate a triangular plot of land. One angle of the garden is  $68^\circ$ , and the sides that surround it are 39.5 ft and 88.5 ft. What is the area of the plot of land?

- [A]  $654.8 \text{ ft}^2$
- [B]  $3241.2 \text{ ft}^2$
- [C]  $1597.0 \text{ ft}^2$
- [D]  $1620.6 \text{ ft}^2$

22. Find the value of  $x$ . [A] 5 [B] 10 [C]  $5\sqrt{5}$  [D]  $10\sqrt{5}$



23. Two concentric circles have radii of 7 and 16 cm. Find the probability that a point chosen at random from the circles is located outside the smaller circle and inside the larger one.  
 [A] 67.2% [B] 5.2% [C] 19.1% [D] 80.9%
24. The diameter of a basketball rim is 18 in. A standard basketball has a circumference 30 in. About how much room is there between the ball and the rim in a shot in which the ball goes in exactly in the center of the rim?  
 [A] 4.78 in. [B] 4.2 in. [C] 9.55 in. [D] 8.45 in. [E] none of the above
25. A design on a balloon is 3 cm wide when the balloon holds  $44\text{ cm}^3$  of air. How much must the balloon hold for the design to be 12 cm wide?  
 [A]  $2816\text{ cm}^3$  [B]  $704\text{ cm}^3$  [C]  $176\text{ cm}^3$  [D]  $2905\text{ cm}^3$
26. Find the word or words that best complete the sentence.  
 A plane and a line ? intersect in a single point.  
 [A] never [B] always [C] sometimes [D] not enough information to tell
27. Calculate the volume of an 11.4-km cube with a hole 4 km in diameter drilled through it. Use  $\pi = 3.14$ .  
 [A]  $636.576\text{ km}^3$  [B]  $1335.36\text{ km}^3$  [C]  $633.576\text{ km}^3$  [D]  $1338.36\text{ km}^3$
28. Find the value of  $x$  to the nearest tenth. [A] 6.8 [B] 7.8 [C] 13.4 [D] 29.4



29. Cylinder  $A$  has radius 1 and height 4 and cylinder  $B$  has radius 2 and height 4. The ratio of the volumes of the two cylinders is

- [A] 1:2      [B] 1:4      [C] 1:1      [D] 5:6      [E] cannot be determined

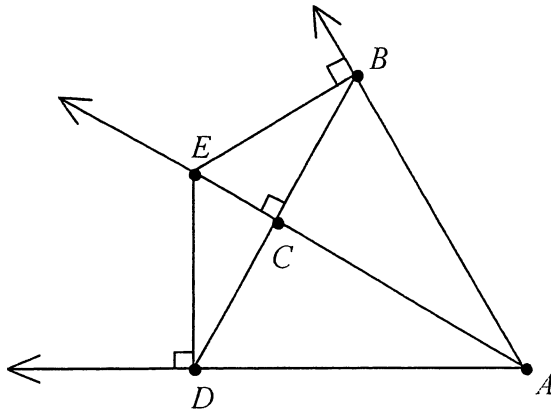
30. Classify the triangle with angles measuring  $82^\circ$ ,  $67^\circ$ , and  $31^\circ$ .

- [A] straight      [B] obtuse      [C] right      [D] acute

31. Consider the sequence  $\frac{2}{1}, \frac{3}{4}, \frac{4}{9}, \frac{5}{16}, \frac{6}{25}, \dots$ . Assuming this pattern continues, find the 9th term.

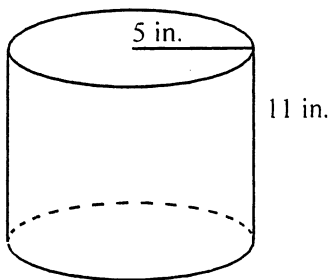
- [A]  $\frac{9}{64}$       [B]  $\frac{10}{81}$       [C]  $\frac{10}{49}$       [D]  $\frac{9}{36}$

32. Given:  $\overrightarrow{AE}$  bisects  $\angle DAB$ . Find  $ED$  if  $CB = 16$  and  $CE = 30$ . (not drawn to scale)



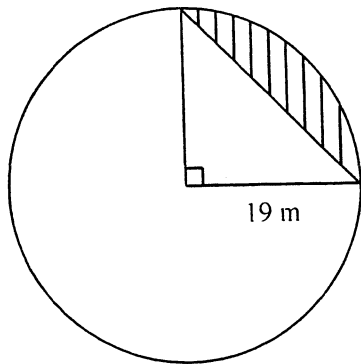
- [A] 14      [B] 34      [C] 46      [D] 480

33. Find the volume of the cylinder. (not drawn to scale)



- [A]  $275\pi \text{ in.}^3$       [B]  $55\pi \text{ in.}^3$       [C]  $66\pi \text{ in.}^3$       [D]  $275\pi \text{ in.}^2$

34. Find the area of the shaded segment. Round your answer to the nearest hundredth.



- [A]  $180.5 \text{ m}^2$       [B]  $386.56 \text{ m}^2$       [C]  $283.53 \text{ m}^2$       [D]  $103.03 \text{ m}^2$

35. Which of the following is an example of the symmetric property?

- [A] If  $x - 4 = y$  and  $y = 3$ , then  $x - 4 = 3$       [B] If  $y = x + 3$ , then  $x + 3 = y$   
 [C]  $x - 4 = x - 4$       [D] If  $x = -4$ , then  $x + 3 = -4 + 3$

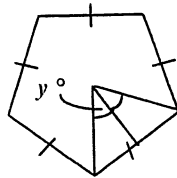
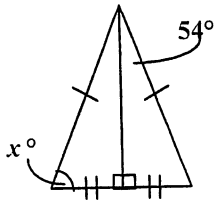
36. Compare the quantity in Column A with the quantity in Column B.

Column A

Column B

$x$

$y$



- [A] The quantity in Column A is greater.      [B] The quantity in Column B is greater.  
 [C] The quantities are equal.  
 [D] The relationship cannot be determined on the basis of the information supplied.

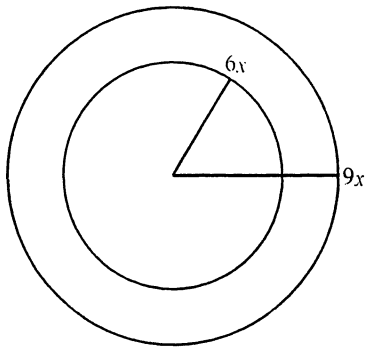
37. Which one of the following gives the distance between the numbers 8 and  $-1$ ?

- [A]  $-9$       [B]  $7$       [C]  $9$       [D]  $-7$

38. A point  $P$  has coordinates  $(4, -3)$ . What are its new coordinates after reflecting point  $P$  in the  $y$ -axis?

- [A]  $(4, -3)$       [B]  $(4, 3)$       [C]  $(-4, -3)$       [D]  $(-4, 3)$

39. Find the ratio of the circumference and of areas of the small circle to the larger one.

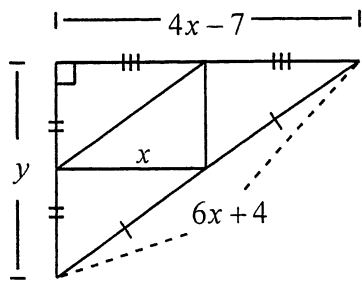


- [A] 3:2; 9:4      [B]  $2x:3x$ ;  $4x:6x$       [C]  $2x:3x$ ;  $4x:9x$       [D] 2:3; 4:9

40. The area of a trapezoid is  $194 \text{ in.}^2$ . If the height is 8 in. and the longer base is 26 in., what is the length of the shorter base? Round your answer to the nearest tenth.

- [A] 7.5 in.      [B] 1.8 in.      [C] 22.5 in.      [D] 24.3 in.

41. Find the values of  $x$  and  $y$ .



- [A]  $x = 3\frac{1}{2}$ ,  $y = 12\frac{1}{2}$       [B]  $x = 3\frac{1}{2}$ ,  $y = 25$   
 [C]  $x = 3\frac{1}{2}$ ,  $y = 24$       [D] none of the above

42. Find the distance between points  $P(-2, -4)$  and  $Q(0, -5)$ .

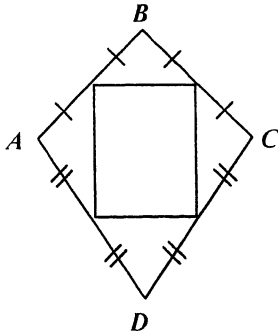
- [A]  $\sqrt{61}$       [B]  $\sqrt{29}$       [C]  $\sqrt{5}$       [D]  $\sqrt{85}$

43. Which of the following *cannot* be the lengths of a  $30^\circ$ - $60^\circ$ - $90^\circ$  triangle?

- [A]  $\frac{2}{3}$ ,  $\frac{4}{3}$ ,  $\frac{2}{3}\sqrt{3}$       [B]  $7$ ,  $\frac{7}{2}$ ,  $7\sqrt{3}$       [C]  $4$ ,  $8$ ,  $4\sqrt{3}$       [D]  $\frac{5}{2}$ ,  $5$ ,  $\frac{5}{2}\sqrt{3}$

44. If  $\angle A$  and  $\angle B$  are supplementary angles and  $m\angle A = 9m\angle B$ , find  $m\angle A$  and  $m\angle B$ .  
 [A] 80, 10                      [B] 81, 9                      [C] 160, 20                      [D] 162, 18

45. Find the area of the rectangle if  $\overline{AC} = 14$  and  $\overline{BD} = 26$ .

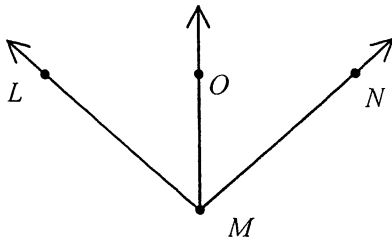


- [A] 364                      [B] 182                      [C] 40                      [D] 91

46. Find the area of the rectangle with the given base and height.  
 4 yd 24 in., 12 yd

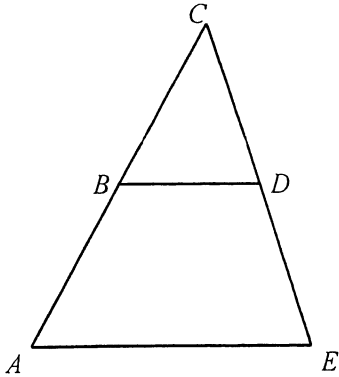
- [A] 56 yd<sup>2</sup>                      [B] 33 yd<sup>2</sup> 12 in.<sup>2</sup>                      [C] 48 yd<sup>2</sup> 96 in.<sup>2</sup>                      [D] 96 yd<sup>2</sup> 48 in.<sup>2</sup>

47. Solve: In the figure (not drawn to scale),  $\overrightarrow{MO}$  bisects  $\angle LMN$ ,  $m\angle LMO = 15x - 28$ , and  $m\angle NMO = x + 84$ . Solve for  $x$  and find  $m\angle LMN$ .



- [A] 4, 32                      [B] 8, 148                      [C] 8, 184                      [D] 4, 36

48. Solve for  $x$  given  $BD = \frac{3}{2}x + 5$  and  $AE = 4x + 5$ . Assume  $B$  is the midpoint of  $\overline{AC}$  and  $D$  is the midpoint of  $\overline{CE}$ .



- [A]  $\frac{5}{6}$                       [B]  $-\frac{1}{5}$                       [C] 5                      [D]  $-\frac{6}{5}$

49. The shorter leg of a  $30^\circ$ - $60^\circ$ - $90^\circ$  triangle is 9.4 inches long. Find the perimeter.  
 [A] 41.49 in.                      [B] 44.48 in.                      [C] 53.17 in.                      [D] 65.13 in.

50. Compare the quantity in Column A with the quantity in Column B.

<u>Column A</u>	<u>Column B</u>
the measure of each exterior angle of a regular pentagon	the measure of each exterior angle of a regular hexagon

- [A] The quantity in Column A is greater.                      [B] The quantity in Column B is greater.  
 [C] The quantities are equal.  
 [D] The relationship cannot be determined on the basis of the information given.

