



# THE MASTER'S SCHOOL

## Pre-Calculus *Mrs. Swenson*

Students who will be taking Pre-Calculus in the upcoming school year are required to complete the attached summer work before the first day of school.

Students are to bring their completed answer sheet to school with them on the second day of school.

This work serves two purposes: it helps students to remember the concepts that they have learned in the past and allows an assessment of topics that need focused review.

This work is necessary to assess the ability of incoming students and to guide the instruction in the first few weeks of classes.

This work should be done during the two weeks before school begins.

### Supply List

TI-84 Graphing calculator (do not get TI-Nspire or TI-89)

Looseleaf notebook with lined paper and graphing paper

Red pen (for marking homework assignments)

In addition - Geometry students will need protractor and compass

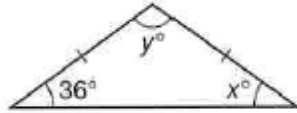
Any questions - contact Mrs. Swenson at [nswenson@masterschool.org](mailto:nswenson@masterschool.org).

## PRE-CALCULUS SUMMER WORK

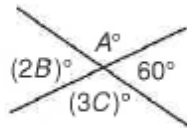
Geometry review:

1. Find the measure of angle  $A$  if five times the complement of angle  $A$  is  $150^\circ$  greater than the supplement of angle  $A$ . (Remember that the complement of angle  $A$  has a measure of  $90^\circ - A$  and the supplement of angle  $A$  has a measure of  $180^\circ - A$ .)
2. Find the measure of angle  $B$  if seven times the complement of angle  $B$  exceeds twice the supplement of angle  $B$  by  $220^\circ$ .
3. Find an angle such that 4 times its complement equals  $200^\circ$ .
4. An equilateral triangle has an altitude of  $2\sqrt{3}$  inches and a perimeter of 12 inches. What is the area of the triangle?
5. An equilateral triangle has an altitude of  $3\sqrt{6}$  cm. and an area of  $18\sqrt{3}\text{cm}^2$  . What is the perimeter of the triangle?
6. An equilateral triangle has a perimeter of 24 m. and an area of  $16\sqrt{3}\text{ m}^2$ . Find the altitude of the triangle.
7. Find the measure of angle  $A$  if the supplement of angle  $A$  is  $20^\circ$  greater than twice the complement of angle  $A$ .
8. The lengths of the sides of a triangle are 7 cm, 12 cm, and 6 cm. Is the triangle a right triangle, an acute triangle, or an obtuse triangle?
9. The complement of angle  $A$  is  $20^\circ$  less than half the supplement of angle  $A$  find the measure of angle  $A$
10. Find an angle such that 3 times its supplement equals  $450^\circ$ .

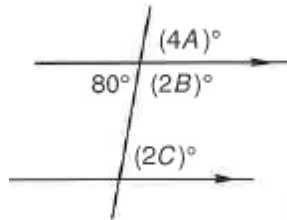
11. Find  $x$  and  $y$ .



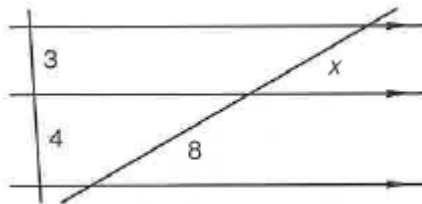
12. Find  $A$ ,  $B$ , and  $C$ .



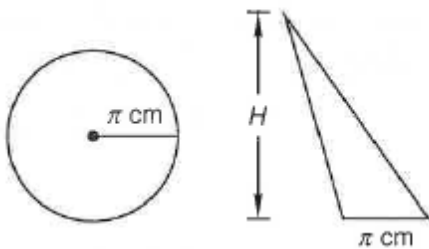
13. Find  $A$ ,  $B$ , and  $C$ .



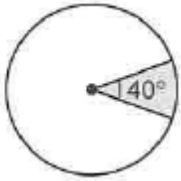
14. Find  $x$ .



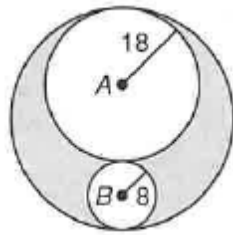
15. The radius of the circle shown is  $\pi$  cm. The base of the triangle is  $\pi$  cm. The area of the circle equals the area of the triangle. What is the height of the triangle?



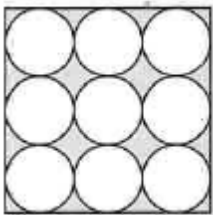
16. The central angle of the shaded sector measures  $40^\circ$ . The radius of the circle is  $3\sqrt{3}$  cm. Find the area of the shaded sector.



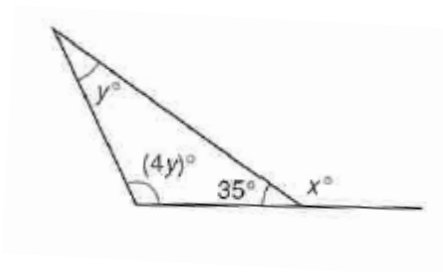
17. In this figure, points  $A$  and  $B$  are the centers of two smaller circles and lie on a diameter of the big circle. The two smaller circles are tangent to the larger circle and to each other. Find the area of the shaded region of this figure. Dimensions are in centimeters.



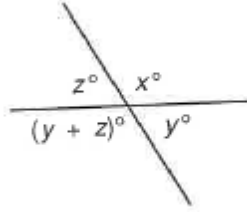
18. In the figure shown, all adjacent circles are tangent to each other and the outer circles are tangent to the square. The sum of the areas of the nine circles is  $52\pi$  m<sup>2</sup>. The circles have equal areas. What is the area of the shaded portion of the figure?



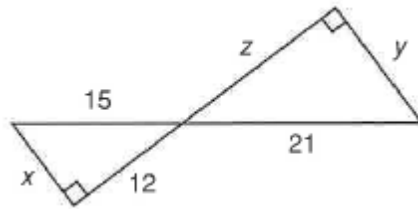
19. Find  $x$  and  $y$ .



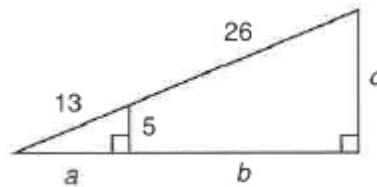
20. Find  $x$ ,  $y$ , and  $z$ .



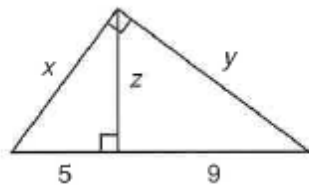
21. Find  $x$ ,  $y$ , and  $z$ .



22. Find  $a$ ,  $b$ , and  $c$ .



23. Find  $x$ ,  $y$ , and  $z$ .



24. Twenty percent of the molybdenum fused. If 1420 grams did not fuse, what was the total mass of molybdenum used?

25. The ratio of pusillanimous brave men to oxymorons on the battlefield is 17 to 2. If the total of both on the battlefield is 342, how many are oxymorons?

26. The number of nickels exceeds the number of dimes by 7. The total value of the coins is \$1.55. (The value of a nickel is \$.05; the value of a dime is \$.10.) Find the number of each coin.

27. Three times the number of reds is one less than twice the number of blues. If the sum of the reds and the blues is 13, how many are red and how many are blue?

28. The ratio of tulips to roses is 17 to 11. If together there are 3444 tulips and roses in the garden, how many are tulips?

29. Forty percent of the fuel was consumed. If 1215 gallons of fuel remain, how much fuel was present initially?

30. Words that were ubiquitous appeared seven times more often than words that appeared seldom. If 296 words were considered, how many words were classified as ubiquitous?

31. In a piggy bank, the number of nickels was 13 more than the number of dimes. The total value of the coins was \$1.85. How many of each type of coin was in the piggy bank?

Simplify each expression in #32 – 34

$$32. \frac{2^{-3}x^0(x^2)}{x^{-3}xy^{-3}y}$$

$$33. -(-3 - 2) + 4(-2) + \frac{1}{-2^{-3}} - (-2)^{-3}$$

$$34. \frac{xy}{y^{-2}} - \frac{3x^4y^4}{x^3y} + \frac{7xy^{-2}}{xy^{-3}}$$

$$35. \text{Solve: } 3^0(2x - 5) + (-x - 5) = -3(x^0 - 2)$$

36. Solve:  $2^2(x - 7) + (3 - 2x) = -5(2x + 1)$

37. Multiply:  $(3x - 2y)(x^2 + xy - y^2)$

38. Solve:  $\begin{cases} r + b = 70 \\ 2r + 3b = 190 \end{cases}$

39. The average of six number is 22. The numbers are 20, 17, 24, 18, 29 and x. Find x.

40. Evaluate  $xy - x(x - y^0)$  if  $x = 2$  and  $y = -\frac{1}{2}$ .

41. Solve:  $\begin{cases} x - 3y = -6 \\ 2x + 5y = 21 \end{cases}$

42. Solve:  $2\frac{1}{4}x - 3\frac{1}{2} = -\frac{1}{16}$

43. Add:  $\frac{3}{x-2} + \frac{4}{x-1} - \frac{1}{x}$

44. Solve:  $-2(-x^0 - 4^0) - 3x(2 - 6^0) = x(-2 - 3^2 - 2) - x(-2 - 2^0)$

45. Solve:  $2^2(x - 7) + (3 - 2x) = -5(2x - 1)$

46. Simplify:  $\frac{7^4 p^4 q^{-1} p q^{-2}}{7^3 p^{-2} q^4}$

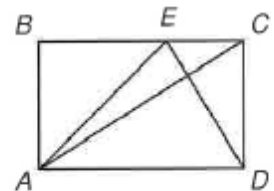
For the remaining problems, you are given two quantities. You are to compare them. If  $A$  is larger, your answer is  $A$ . If  $B$  is larger, your answer is  $B$ . If they are equal, your answer is  $C$ . If there is not enough information given to determine which is larger, your answer is  $D$

47. A.  $\sqrt{\frac{1}{4}} + \sqrt{\frac{1}{25}}$       B.  $\sqrt{\frac{1}{4} + \frac{1}{25}}$

48. Let  $x$  and  $y$  be real numbers. If  $x > 0$  and  $y > 0$ , compare: A.  $y - x$       B.  $y + x$

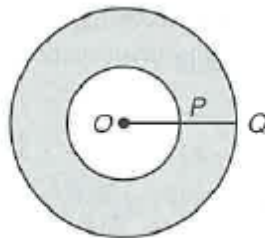
49. Given the diagram at the right where  $ABCD$  is a rectangle and  $E$  is arbitrarily chosen on segment  $BC$

Compare      A. the area of  $\triangle AED$       B. the area of  $\triangle ACD$



50. Given:  $O$  is the center of the circle shown and  $OP = 4$  and  $OQ = 8$ .

Compare: A. Area of the outer circle      B. Twice the area of the inner circle





## PRE-CALCULUS ANSWERS

1. \_\_\_\_\_

12. \_\_\_\_\_

23. \_\_\_\_\_

2. \_\_\_\_\_

13. \_\_\_\_\_

24. \_\_\_\_\_

3. \_\_\_\_\_

14. \_\_\_\_\_

25. \_\_\_\_\_

4. \_\_\_\_\_

15. \_\_\_\_\_

26. \_\_\_\_\_

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

16. \_\_\_\_\_

27. \_\_\_\_\_

6. \_\_\_\_\_

17. \_\_\_\_\_

28. \_\_\_\_\_

7. \_\_\_\_\_

18. \_\_\_\_\_

29. \_\_\_\_\_

8. \_\_\_\_\_

19. \_\_\_\_\_

30. \_\_\_\_\_

9. \_\_\_\_\_

20. \_\_\_\_\_

31. \_\_\_\_\_

10. \_\_\_\_\_

21. \_\_\_\_\_

32. \_\_\_\_\_

11. \_\_\_\_\_

22. \_\_\_\_\_

33. \_\_\_\_\_

34. \_\_\_\_\_

40. \_\_\_\_\_

46. \_\_\_\_\_

35. \_\_\_\_\_

41. \_\_\_\_\_

47. \_\_\_\_\_

36. \_\_\_\_\_

42. \_\_\_\_\_

48. \_\_\_\_\_

37. \_\_\_\_\_

43. \_\_\_\_\_

49. \_\_\_\_\_

38. \_\_\_\_\_

44. \_\_\_\_\_

50. \_\_\_\_\_

39. \_\_\_\_\_

45. \_\_\_\_\_