

WJHS Summer Math Packet
For Rising Geometry/Honors Geometry Students

This packet is an optional review of the skills that will help you be successful in Geometry/Honors Geometry. By completing this packet over the summer, you will not only keep your brain mathematically active but you will be able to identify skills that you need to strengthen for your year ahead. Complete the exercises on a separate sheet of paper then check your answers with the Answer Key. If you struggle with any of the exercises, please seek help from a friend, parent, sibling, book, or online resource. Enjoy your math review and we look forward to meeting you in August!

Formulas:

Area of rectangle or parallelogram: Area = Base x Height

Area of a triangle: Area = $\frac{1}{2}$ Base x Height

Area of a trapezoid: Area = $\frac{1}{2}$ Height (Sum of the Bases)

Area of a circle: Area = π (radius squared) = πr^2

Volume of rectangular prism: Volume = Length x Width x Height

Volume of cylinder: Volume = Area of the base x Height of cylinder = $\pi r^2 h$

Distance: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ Slope: $m = \frac{(y_2 - y_1)}{(x_2 - x_1)}$ Midpoint: $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

** For rising Honors Geometry students only.*

I. Fractions, Decimals, and Percents

Perform the indicated operations. Express your answer as a simplified fraction.

1.) $\frac{6}{5} - \frac{1}{5} = 1$ 2.) $\frac{6}{7} + \frac{2}{3} = \frac{32}{21}$ 3.) $\frac{9}{11} - \frac{2}{5} = \frac{23}{55}$ 4.) $\frac{6}{11} \cdot \frac{2}{3} = \frac{4}{11}$

5.) $\frac{6}{7} + \frac{1}{5} = \frac{30}{7}$ 6.) $\frac{3}{7} \cdot \frac{1}{9} = \frac{1}{21}$ 7.) $1\frac{1}{2} + 3\frac{2}{3} = \frac{31}{6}$ 8.) $8\frac{3}{10} - 6\frac{7}{9} = \frac{137}{90}$

9.) $3\frac{1}{3} \cdot 6\frac{4}{5} = \frac{68}{3}$ 10.) $6\frac{1}{5} \div 8\frac{2}{5} = \frac{31}{42}$

Use a calculator to convert the following fractions to decimals. Round your answer to the nearest thousandth.

11.) $\frac{56}{3} \approx 18.667$ 12.) $\frac{5}{9} \approx 0.556$ 13.) $8\frac{13}{14} \approx 8.929$ 14.) $12\frac{15}{19} \approx 12.789$

Convert the following percentages to simplified fractions.

15.) 72% = $\frac{18}{25}$ 16.) 31.5% = $\frac{63}{200}$ 17.) 1.99% = $\frac{199}{10000}$ 18.) 0.02% = $\frac{1}{5000}$

II. Simplifying Radicals

Find the square root of the following numbers.

19.) $\sqrt{49} = 7$

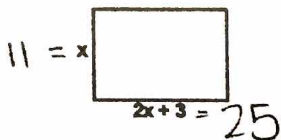
20.) $\sqrt{81} = 9$

21.) $\sqrt{4} = 2$

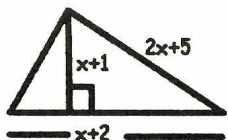
22.) $\sqrt{169} = 13$

III. Geometric Figures

23.) Find the length of each side when the perimeter of the rectangle is 72 cm.



*24.) The area of the triangle is 10 cm. Solve for x.



$x = 3$

25.) In a circle, the radius = $(x + 2)$ cm. Find the **area**, the **circumference**, and the **diameter** of the circle in terms of x. (Leave answers in terms of π .)

$A = \pi(x+2)^2 \text{ cm}^2$ $C = \pi(2x+4) \text{ cm}$ $d = 2x+4 \text{ cm}$

26.) The circumference of a circle is 6π m. Find the radius and the area of the circle in terms of π .

$r = 3$ $A = 9\pi \text{ m}^2$

27.) Find the area, in terms of x, of a rhombus if its base has a measure of $x - 9$ and its height is $x + 7$. $A = (x-9)(x+7) = x^2 - 2x - 63 \text{ u}^2$

28.) Find the area, in terms of x, of a triangle if its base has a measure of $2x + 16$ and its height is $x + 4$. $A = x^2 + 12x + 32 \text{ u}^2$

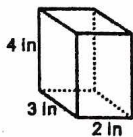
29.) Find the area, in terms of x, of a square if each side has a measure of $x - 8$.

$A = (x-8)^2 = x^2 - 16x + 64 \text{ u}^2$

*30.) Find the measure, in terms of x, of each side of a square if the area = $x^2 - 6x + 9$.

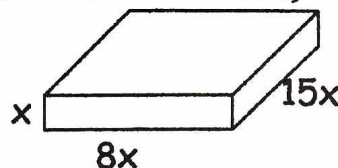
$s = x - 3$

31.) Find the surface area and volume of the following rectangular prisms



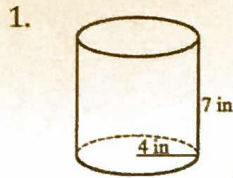
$V = 24 \text{ in}^3$
 $SA = 52 \text{ in}^2$

(Answer will be in terms of x.)

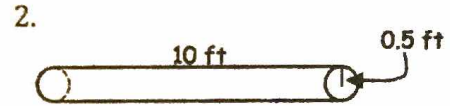


$V = 120x^3 \text{ units}^3$
 $SA = 286x^2 \text{ units}^2$

32.) Find the volume of the following cylinders.



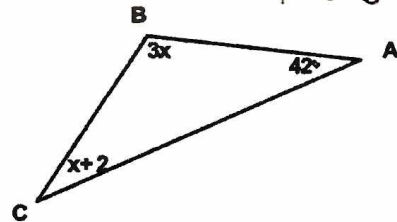
$$V = 112\pi \text{ in}^3 \approx 351.86 \text{ in}^3$$



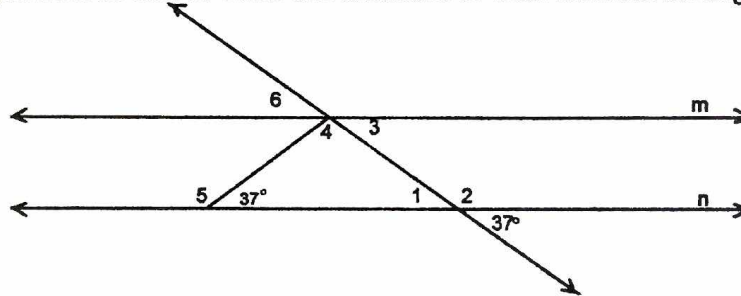
$$V = 2.5\pi \text{ ft}^3 \approx 7.85 \text{ ft}^3$$

33.) Find the measure of $\angle C$ if the measure of $\angle A$ is 42° .

$$m\angle C = 36^\circ$$

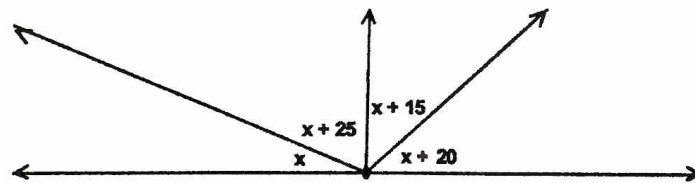


34.) Line m is parallel to line n . Find the measure of each numbered angle.



$$\begin{aligned} m\angle 1 &= 37^\circ \\ m\angle 2 &= 143^\circ \\ m\angle 3 &= 37^\circ \\ m\angle 4 &= 106^\circ \\ m\angle 5 &= 143^\circ \\ m\angle 6 &= 37^\circ \end{aligned}$$

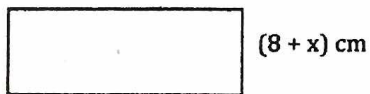
35.) Solve for x .



$$x = 30$$

36.) Find the **perimeter** and **area** of each of the following.

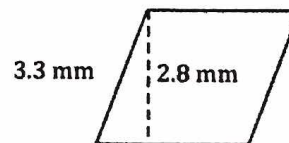
a. Answer will be in terms of x
18x cm



$$P = 38x + 16 \text{ cm}$$

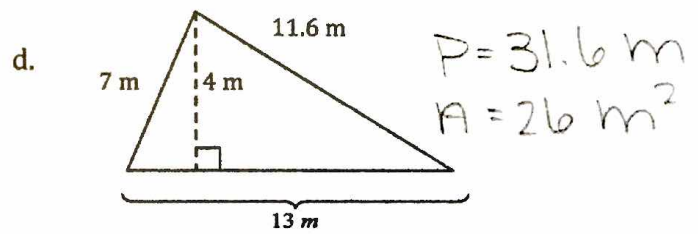
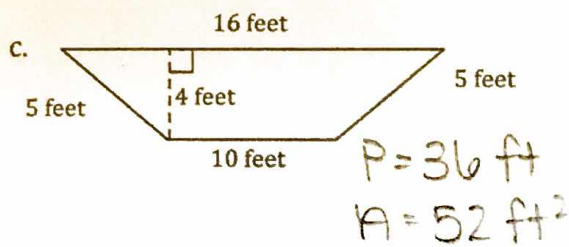
$$A = 18x^2 + 144x \text{ cm}^2$$

b. The figure is a rhombus.



$$P = 13.2 \text{ mm}$$

$$A = 9.24 \text{ mm}^2$$



37.) Find the area and circumference of a circle with a radius of 5.2 cm.

$$A = 27.04\pi \approx 84.949 \text{ cm}^2 \quad C = 10.4\pi \approx 32.673 \text{ cm}$$

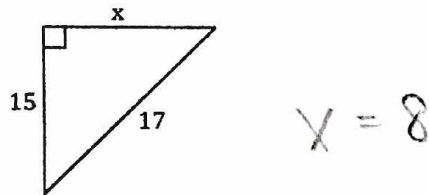
*38.) Find the radius and area of a circle with a circumference of 8π feet.

$$r = 4 \quad A = 16\pi \approx 50.265 \text{ ft}^2$$

39.) The area of a circle is 25π . Find the diameter and circumference.

$$r = 5 \text{ units} \quad d = 10 \text{ units} \quad C = 10\pi \text{ units}$$

40.) Find x .



IV. Solving Equations

Solve each of the following linear equations.

41.) $\frac{x}{5} = \frac{12}{25} \quad x = \frac{12}{5}$

42.) $\frac{6}{x+3} = \frac{4}{2x-7} \quad x = \frac{27}{4}$

43.) $\frac{2}{3}x + 4 = 6 \quad x = 3$

44.) $2(x+1) - 3 = 4 \quad x = \frac{5}{2}$

45.) $6x - 3 = 45 - 30 \quad x = 3$

*46.) $x(5x) - 5 = 20x^2 - 25 \quad x = \pm \sqrt{\frac{4}{3}}$

Solve the equations by factoring.

47.) $x^2 - x - 72 = 0$

$$x = 9 \text{ or } x = 8$$

*48.) $2x^2 + 9x - 5 = 0$

$$x = -5 \text{ or } x = \frac{1}{2}$$

49.) $x^2 - 64 = 0$

$$x = 8 \text{ or } x = -8$$

*50.) $4x^2 - 36x + 72 = 0$

$$x = 6 \text{ or } x = 3$$

Use the quadratic formula to solve.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

51.) $2x^2 + 3x - 2 = 0$

$x = \frac{1}{2}$ or $x = -2$

52.) $0 = 8x^2 + 26x + 15$

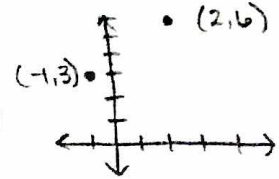
$x = -\frac{5}{2}$ or $x = -\frac{3}{4}$

*53.) $3x^2 + 7x - 5 = -3$

$x = \frac{-7 \pm \sqrt{73}}{6}$

V. Coordinate Geometry and Equations of Lines

54.) Sketch a coordinate grid and plot the following points: (2,6) and (-1, 3)



55.) Find the midpoint between (3,5) and (-2, 7) $(\frac{1}{2}, 6)$

56.) Find the slope of the line passing through (2, -5) and (-3, -6) $m = 1/5$

57.) Find the distance between (1, 4) and (4, 0) 5

58.) Write the equation of a line with a slope of 0 and a y-intercept of (0, 12). $y = 12$

59.) Write the equation of a line that contains points A(-2, 3) and B(-6, -5). $y = 2x + 7$

60.) Write the equation of a line that contains points E(5, 0) and F(-3, 6). $y = -\frac{3}{4}x + \frac{15}{4}$

61.) Parallel lines have the same slope. Write the equation of a line parallel to \overline{EF} (from #48) and passing through (1, -2).

$y = -\frac{3}{4}x - \frac{5}{4}$

VI. Solving Literal Equations

62.) Solve for e: $p = b + 2e$ $e = \frac{p-b}{2}$

63.) Solve for F: $C = \frac{5}{9}(F - 32)$ $F = \frac{9}{5}C + 32$

64.) Solve for a: $A = \pi ab$ $a = \frac{A}{\pi b}$

*65.) Solve for r: $S = \frac{x-a}{r-1}$ $r = \frac{x-a}{S} + 1$

*66.) Solve for r: $S = \frac{a}{1-r}$ $r = 1 - \frac{a}{S}$

VII. Algebraic Simplification

67.) $\pi r(2r) + \pi r^2$
 $3\pi r^2$

68.) $(3mz)(2mz)$
 $6m^2z^2$

69.) $\left(\frac{3}{5}\pi t\right)\left(\frac{1}{3}\pi\right)$
 $\frac{1}{5}\pi^2 t$