Summer Math Packet: Incoming Pre-Algebra (7th)

This packet is organized by math concept.
Read the skill review for each math concept.
Complete the required number of review questions for each section.

Be ready to turn this in to your math teacher at the start of the school year in August.

Summer math work has been shown to reduce summer learning loss and will help you be a more successful student in math next year!

Adding & Subtracting Rational Numbers

Determine whether you should add or subtract using integer rules. Then add or subtract.

Decimals:

- Line up the decimal points
- Add or subtract and bring the decimal point down
- Use integer rules to determine the sign of the answer

ex: $-9.8 + 6.24$

neg + pos: subtract

$$\begin{array}{r} 9.80 \\ -\ 6.24 \\ \hline 3.56 \end{array} \rightarrow \boxed{-3.56}$$

Fractions/Mixed Numbers:

- Find a common denominator and then add or subtract
- Borrow or convert an improper fraction answer, if necessary
- Use integer rules to determine the sign of the answer

ex: $5\frac{3}{4} - \left(-3\frac{7}{8}\right)$

$\rightarrow 5\frac{3}{4} + 3\frac{7}{8}$

pos + pos: add

$$\begin{array}{r} 5\frac{3}{4} = \frac{6}{8} \\ +\ 3\frac{7}{8} = \frac{7}{8} \\ \hline 8\ \frac{13}{8} \end{array} \rightarrow \boxed{9\frac{5}{8}}$$

Multiplying & Dividing Rational Numbers

Determine the sign of the answer using integer rules. Then multiply or divide.

Multiplying Decimals:

- Ignore the decimal points. Multiply the numbers.
- Count the decimal places in the problem to determine the location of the decimal point in the answer.

ex: $-9.23 \cdot (-1.1)$

neg · neg = pos

$$\begin{array}{r} 9.23 \quad \leftarrow 2 \text{ dec places} \\ \times\ 1.1 \quad \leftarrow 1 \text{ dec place} \\ \hline 923 \\ 9230 \\ \hline 10153 \end{array} \rightarrow \boxed{10.153}$$

(3 dec places)

Dividing Decimals:

- Move the decimal in the divisor to the end of the number
- Move the decimal in the dividend the same number of places and then bring it straight up in quotient

ex: $-5.2 \div 0.2$

neg ÷ pos = neg

$$0.2\overline{)\,5.2.} \rightarrow 26 \rightarrow \boxed{-26}$$

Multiplying Fractions:

- Convert mixed numbers to improper fractions.
- Cross-simplify if possible
- Multiply the numerators and multiply the denominators
- Simplify if necessary

ex: $-1\frac{3}{4} \cdot \frac{6}{14}$

neg · pos = neg

$$\rightarrow \frac{\cancel{7}^{1}}{\cancel{4}_{2}} \cdot \frac{\cancel{6}^{3}}{\cancel{14}_{2}} = \frac{3}{4} \rightarrow \boxed{-\frac{3}{4}}$$

Dividing Fractions:

- Convert mixed numbers to improper fractions
- Flip the second fraction to its reciprocal and multiply the two fractions
- Simplify if necessary

ex: $-\frac{1}{2} \div \left(-\frac{3}{8}\right)$

neg ÷ neg = pos

$$\rightarrow \frac{1}{\cancel{2}_{1}} \cdot \frac{\cancel{8}^{4}}{3} = \frac{4}{3} \rightarrow \boxed{1\frac{1}{3}}$$

Find the sum, difference, product, or quotient. (Complete 8 - mixed operations)

25. $38.61 + 36.841$	26. $1.755 - 1.23$	27. $0.71 \cdot 9.2$	28. $13.12 \div 0.1$
29. $3.651 - (-12.63)$	30. $-3.9 + (-7.6)$	31. $-14.846 \div 2.6$	32. $6 \cdot (-16.7)$
33. $26.474 - 14.527$	34. $-2.1 + 3.78$	35. $-6.15 \div (-8.2)$	36. $-12.8 \cdot (-4.88)$

Find the sum, difference, product, or quotient. Write your answer in simplest form. (complete 8)

37. $15\frac{1}{2} + 15\frac{1}{4}$	38. $18\frac{11}{20} - 17\frac{1}{2}$	39. $3\frac{3}{7} \div 5\frac{1}{3}$	40. $4\frac{1}{2} \cdot 2\frac{2}{5}$
41. $3\frac{1}{3} - 5\frac{1}{9}$	42. $5 \cdot \left(-1\frac{2}{5}\right)$	43. $-7\frac{3}{5} + \left(-3\frac{5}{6}\right)$	44. $-2\frac{1}{12} \div \frac{3}{8}$
45. $9 \div \left(-4\frac{1}{2}\right)$	46. $-18 + 3\frac{4}{5}$	47. $2\frac{5}{6} \cdot \left(-2\frac{2}{3}\right)$	48. $-4\frac{7}{10} - 3\frac{2}{5}$

Order of Operations

Evaluate numerical expressions that contain multiple operations in the following order:

1. Grouping Symbols (complete operations in parentheses, brackets, etc.)
2. Exponents
3. Multiplication & Division (left to right)
4. Addition & Subtraction (left to right)

ex: $-2(-5 + 9)^2 - (-8) + 9$

$-2(4)^2 - (-8) + 9$

$-2(16) - (-8) + 9$

$-32 - (-8) + 9$

$-24 + 9$

→ $\boxed{-15}$

Evaluating Algebraic Expressions

1. Substitute the given values for the variables in the expression
2. Evaluate the expression using the order of operations

ex: evaluate

$a - bc + b^2$

for $a = -7$, $b = 5$, $c = -1.5$

$-7 - (5)(-1.5) + 5^2$

$-7 - (5)(-1.5) + 25$

$-7 - (-7.5) + 25$

$0.5 + 25$

→ $\boxed{25.5}$

Evaluate the numerical expression. Be sure to use the order of operations! (Complete 6)

49. $78 + (-2) \cdot (-56)$	50. $-65 + \frac{6}{-3} + 40$	51. $-94 - [2 - 3(24 - 12)]$	52. $43 + (-23) - (-57)$
53. $-15 - (-11) + 5 \cdot (-4)^3$	54. $-26 - (-64) + (-3)^4$	55. $-84 \div 4 + (-20)$	56. $-56 + (-50) + (-7) \cdot (-9)$
57. $-7.6 - 3 + 2.1 \cdot (-8)$	58. $-\frac{2}{3} + \frac{5}{6} \div \frac{1}{2}$	59. $-8 + 3(-2.7 + 4.23)$	60. $-3\frac{1}{2} \cdot \left(-2\frac{3}{4}\right) + \left(-4\frac{1}{4}\right)$

Evaluate the algebraic expression for $a = -12$, $b = 6$, $c = -4$, and $d = 3$. (Complete all)

61. $a - b + c$	62. $b - cd$	63. $b(cd - a)$
64. $\frac{b}{c} - d$	65. $bd + ac$	66. $\frac{a}{d} + c^2$

One-Step Equations

- Addition Equations:
  Subtract the number being added to the variable from both sides of the equation

ex: $y + 23 = -9$
$-23 \quad -23$
$y = -32$

- Subtraction Equations:
  Add the number being subtracted from the variable to both sides of the equation

ex: $w - 13 = -5$
$+13 \quad +13$
$w = 8$

- Multiplication Equations:
  Divide both sides of the equation by the number next to the variable

ex: $\frac{6x}{6} = \frac{-18}{6}$
$x = -3$

- Division Equations:
  Multiply both sides of the equation by the number under the variable

ex: $\frac{h}{3} \cdot 3 = 4 \cdot 3$
$h = 12$

Two-Step Equations

- Undo operations one at a time with inverse operations, using the order of operations in reverse
  (i.e. undo addition/subtraction before multiplication/division)

ex: $7x - 4 = -32$
$+4 \quad +4$
$\frac{7x}{7} = \frac{-28}{7}$
$x = -4$

- Be sure to always do the same thing to both sides of the equation!

ex: $\frac{j}{5} + 13 = 15$
$-13 \quad -13$
$\frac{j}{5} \cdot 5 = 2 \cdot 5$
$j = 10$

ex: $\frac{b+7}{3} \cdot 3 = -2 \cdot 3$
$b + 7 = -6$
$-7 \quad -7$
$b = -13$

Solve the one-step equation. (Complete all)

67. $19 + j = -34$	68. $m - 26 = 13$	69. $\frac{x}{5} = -3$	70. $12f = 216$
71. $g - (-31) = -7$	72. $\frac{h}{9} = 13$	73. $b + (-3) = -9$	74. $-4w = -280$

Solve the two-step equation. (Complete Co)

75. $5m - 3 = 27$	76. $7 + \frac{y}{2} = -3$	77. $4 + 3r = -8$	78. $\frac{1}{2}p - 4 = 7$
79. $\frac{k + 8}{3} = -2$	80. $\frac{f}{5} - (-13) = 12$	81. $-15 - \frac{g}{3} = -5$	82. $-8 + 4m = 2$
83. $-18 - \frac{3}{4}v = 3$	84. $\frac{-5 + n}{4} = -1$	85. $3.5m + 0.75 = -6.25$	86. $2y + 3 = 19$

Geometry

Area Formulas

*** Remember that area is the space *inside* a figure! ***

- Area of a Rectangle = length x width
- Area of a Parallelogram = base x height
- Area of a Triangle = ½ base x height
- Area of a Circle = π x radius^2

Perimeter Formulas

*** Remember that perimeter is the distance *around* a figure! ***

- Perimeter of Any Polygon: add up all of the side lengths
- Circumference of a Circle = 2 x π x radius

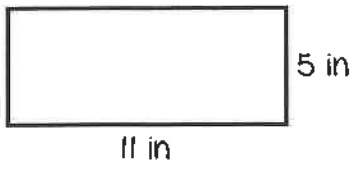
Volume Formula

*** Remember that volume is the capacity of a 3D figure! ***

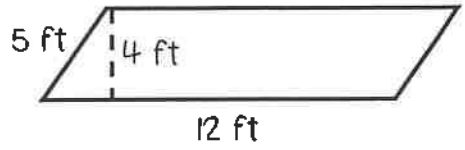
- Volume of a Rectangular Prism: length x width x height

Find the area and perimeter (or circumference) of each figure. Use 3.14 for π. (Complete all)

73.



74.



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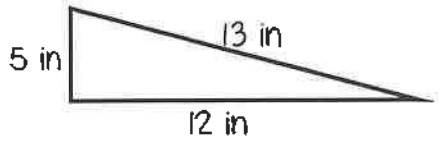

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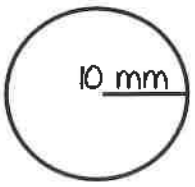
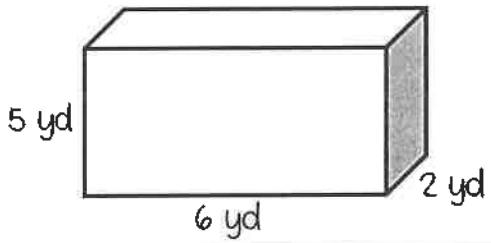


Find the volume. (complete)

77.



Solve each word problem. (complete)

78. Danny is installing a fence around his rectangular yard. His yard is 20 feet long by 45 feet wide. If the fencing he picked out costs $25 per foot, how much money will Danny spend on the fence?

79. Tameka wants to put a carpet in her rectangular bedroom. Her room is 22 feet long by 18 feet wide. How much carpeting will Tameka need?

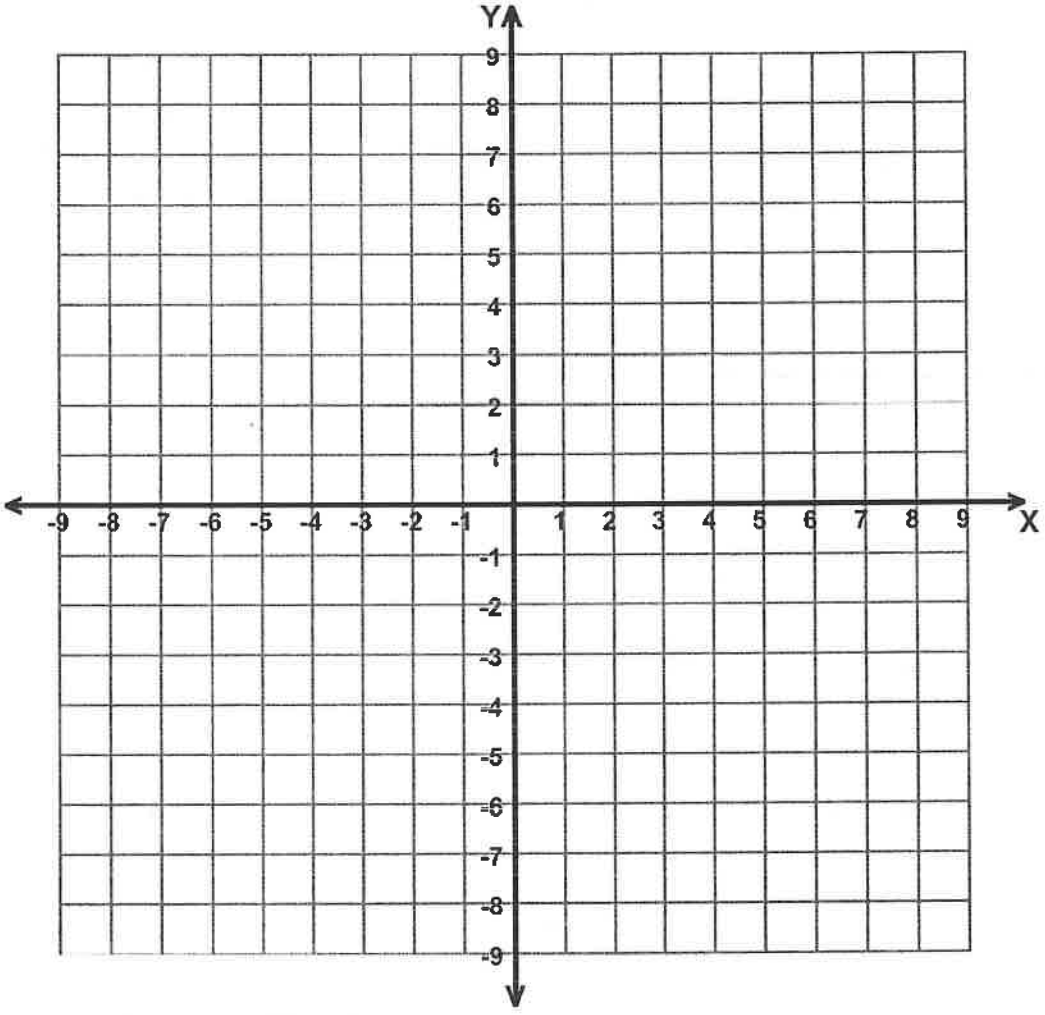
80. Don wants to bring some sand home from his vacation at the beach. He has a box that is 3 inches wide, 4 inches long, and 2 inches tall. How much sand can he fit in the box?

Name : _____ Score : _____

Teacher : _____ Date : _____

Complete this page.

Four Quadrant Graphing Puzzle



Connect each sequence of points with a line.

(0,4) , (4,8) , (8,4) , (4,-3) , (0,4) End of Sequence

(4,8) , (4,-3) End of Sequence

(0,4) , (8,4) End of Sequence

(4,4) , (6,-3) , (7,-5) , (9,-7) End of Sequence

(4,-3) , (2,-6) , (0,-7) , (-8,-7) End of Sequence

(-6,-5) , (-6,-9) , (-7,-9) , (-5,-5) , (-6,-5) End of Sequence

(-2,-5) , (-2,-9) , (-1,-9) , (-3,-5) , (-2,-5) End of Sequence

(2,-4) , (2,-8) , (3,-8) , (1,-4) , (2,-4) End of Sequence

What is the shape ? _____