Kennedy High School
Summer 2021 Math Packet
*For Rising Quantitative Literacy Students*

This packet is an optional review of the skills that will help you be successful in Statistics in the fall. By completing this packet over the summer, you will keep your brain mathematically active and you will also be able to identify skills that you need to strengthen. 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!

I. **Factors.** Write the factor pairs for each number.

   ![Factors Example](http://www.mathsisfun.com/greatest-common-factor.html)

   - a) 48
   - b) 72
   - c) 126
   - d) 39
   - e) 53
   - f) 121

II. **Greatest Common Factor (GCF).** Find the GCF for each pair of factors.

   a) 12 and 20
   - b) 54 and 81
   - c) 15 and 70
   - d) 27 and 72
   - e) 18 and 63
   - f) 169 and 39

III. **Order of Operations and Integer Operations.** Simplify each expression.

   ![Order of Operations Example](http://www.mathsisfun.com/operation-order-nedmas.html)

   - a) 3 - 4
   - b) -14 - 8
   - c) -7 + 3
   - d) -4 + 9
   - e) -1 - 7
   - f) -2 - 9
   - g) -4 • -2
   - h) -54 • 9
IV. Fractions. Perform the indicated operation. Make sure final answer is simplified.

http://www.mathsisfun.com/fractions.html

\[\begin{align*}
\text{a)} & \quad \frac{2}{5} \cdot \frac{1}{5} \\
\text{b)} & \quad \frac{3}{4} \cdot \frac{2}{3} \\
\text{c)} & \quad \frac{1}{2} \div \frac{5}{7} \\
\text{d)} & \quad -\frac{12}{7} \cdot \frac{3}{14} \\
\text{e)} & \quad \frac{5}{8} \cdot \frac{4}{10} \\
\text{f)} & \quad \frac{3}{4} \cdot \frac{8}{9} \\
\text{g)} & \quad \frac{1}{3} \div \frac{1}{2} \\
\text{h)} & \quad \frac{2}{9} \div \frac{5}{3}
\end{align*}\]

V. Combining Like Terms and Distributive Property. Simplify.

http://www.glencoe.com/sec/math/brainpops/00112041/00112041.html


\[\begin{align*}
\text{a)} & \quad 2 + 3y - 5y \\
\text{b)} & \quad 9x + 6 - 5x \\
\text{c)} & \quad 15n + 2n - 8n \\
\text{d)} & \quad 4x^2 - 5x^2 + 7x \\
\text{e)} & \quad 3p - 7p^2 + 4p - 2p^2 \\
\text{f)} & \quad -9 - 8x - 4 - 7x \\
\text{g)} & \quad 3(y + 6) \\
\text{h)} & \quad -4(2x + 7y) \\
\text{i)} & \quad (4r - 5)(-2) \\
\text{j)} & \quad 3x + 7(x - 4) \\
\text{k)} & \quad 2 - 7(3 - 5x) \\
\text{l)} & \quad -3(x + 1) - 2 \\
\text{m)} & \quad -2(x + 5) + 3(4x - 9) \\
\text{n)} & \quad 9(3x + 4) - 5(3 - 2x) \\
\text{o)} & \quad 7(w + 3y) - 6(2w + 3y)
\end{align*}\]
VI. Solving one-step equations. Solve each equation.

\[ a) \ z - 7 = -3 \quad b) \ p + 7 = 9 \quad c) \ 8 + q = -4 \quad d) \ 3a = -27 \]

\[ e) \ -5y = 23 \quad f) \ \frac{w}{3} = 8 \quad g) \ \frac{x}{-6} = 9 \quad h) \ \frac{1}{5}x = 12 \]

VII. Translating Verbal Phrases

<table>
<thead>
<tr>
<th>Hint</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>More, sum, plus = addition</td>
<td>Difference, less, minus = subtraction</td>
</tr>
<tr>
<td>Product, time, multiplied = multiplication</td>
<td>Quotient, divided by = division</td>
</tr>
<tr>
<td>is = Equal to</td>
<td></td>
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</tbody>
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a) The difference of 7 and 10 times a number
b) 11 plus the quotient of a number and 7
c) Two less than the sum of six and a number
d) Half of a given number
e) The sum of 6 and a number
f) 3 less than 4 times a given number
g) The sum of 6 and a number is 18.
h) Sixteen more than a number is 36.
i) 12 more than a number
j) One number decreased by the sum of 10 and the square of another number
VIII. Inequalities. Graph the inequality on a number line.

http://www.mathsisfun.com/algebra/inequality.html

$\rightarrow$ less than, open circle  \hspace{1cm} $\leq$ \hspace{1cm} less than or equal to, closed circle

$\rightarrow$ greater than, open circle \hspace{1cm} $\geq$ \hspace{1cm} greater than or equal to, closed circle

a) \hspace{0.5cm} x \geq 3 \hspace{1.5cm} b) \hspace{0.5cm} y \leq -8 \hspace{1.5cm} c) \hspace{0.5cm} 5 > w

d) \hspace{0.5cm} k < -0.5 \hspace{1.5cm} e) \hspace{0.5cm} \frac{1}{3} < q \hspace{1.5cm} f) \hspace{0.5cm} \frac{-13}{4} \geq w

IX. Rounding. Round each number to the nearest hundredth.

http://www.mathsisfun.com/rounding-numbers.html

a) 15.7895 \hspace{1.5cm} b) -2.5654 \hspace{1.5cm} c) \frac{2}{3} \hspace{1.5cm} d) \frac{4}{7}

e) 4.99762 \hspace{1.5cm} f) \frac{1}{6} \hspace{1.5cm} g) -3.89254

X. Operations on Numbers

A. Absolute Value

http://www.mathsisfun.com/numbers/absolute-value.html

Simplify. Evaluate.

1. $|7| = \hspace{1cm}$ 2. $|-41| = \hspace{1cm}$ 3. $|-x| + 1\frac{1}{2}$ if $x = \frac{1}{2}$ \hspace{1cm} $\hspace{1cm}$

4. $14 - |c|$ if $c = -10$ \hspace{1cm} $\hspace{1cm}$
B. Rational Numbers

Simplify.

5. \( 84 + (-90) = \) \hspace{1cm} 6. \( \frac{-12}{30} = \) \hspace{1cm} 7. \( \frac{-3}{4} + \frac{5}{4} = \)

8. \( \frac{-2}{3} - \frac{1}{4} = \) \hspace{1cm} 9. \( \frac{-1}{5} - \left( \frac{-4}{7} \right) = \) \hspace{1cm} 10. \( \left( \frac{2}{3} \right) \left( \frac{-15}{16} \right) = \)

11. \( \left( \frac{-1}{2} \right) \left( \frac{-1}{3} \right) \left( \frac{-3}{4} \right) = \) \hspace{1cm} 12. \( \frac{-6(-6 + 2)}{-10 + (-2)} = \) \hspace{1cm} 13. \( \left( \frac{-3}{4} \right) \left( \frac{1}{2} \right) = \)

14. \( \frac{-15}{32} + \left( \frac{-3}{10} \right) = \) \hspace{1cm} 15. \( \frac{57y - 12}{3} = \)

Evaluate.

16. \( -3cd \) if \( c = \frac{1}{2}, d = \frac{2}{3} \) \hspace{1cm} 17. \( c^2 \left( \frac{-1}{3} \right) \) if \( c = -6 \)

C. Radicals

Simplify.

18. \( \sqrt{64} = \) \hspace{1cm} 19. \( -\sqrt{81} = \) \hspace{1cm} 20. \( -\sqrt{\frac{25}{16}} = \)

21. \( \sqrt{72} = \) \hspace{1cm} 22. \( \sqrt{54} = \) \hspace{1cm} 23. \( \sqrt{75} = \)

D. Exponents

Simplify.

24. \( 7^2 = \) \hspace{1cm} 25. \( (-4)^2 = \) \hspace{1cm} 26. \( -5^2 = \) \hspace{1cm} 27. \( \left( \frac{-3}{4} \right)^2 = \)
E. Order of Operations  http://www.themathpage.com/alg/algebraic-expressions.htm#order

Simplify each expression using PEMDAS.

28. \[(12 - 14) - 10^2 + 2\] : \(5^2\)  
29. \[
\frac{50 - (8 - 9) + \frac{12}{4}}{4^2 - 7}
\]

Evaluate.

30. \(b^2 - 4ac\) if \(a = 3, b = -5, c = -1\)  
31. \(mx + b\) if \(m = -\frac{2}{5}, b = -\frac{3}{10}, \ x = -1\)

XI. Linear Equations in One Variable  http://www.themathpage.com/alg/equations.htm

Solve each linear equation. A solution is a value for the variable that makes the equation true. You should check each solution to verify that it makes the left side of the equation equal to the right side.

32. \(8 - 5w = -37\)  
33. \(\frac{b + 1}{3} = 2\)  
34. \(\frac{5}{2}c - 8 = -3\)  
35. \(-\frac{h}{3} - 4 = 13\)

36. \(2.5g + 0.45 = 0.95\)  
37. \(8 + 4k = -10 + k\)

38. \(\frac{2}{3}n + 8 = \frac{1}{2}n + 2\)  
39. \(-7(2d - 4) = 5(6 - 2d)\)

40. \(\frac{1}{9}(2m - 16) = \frac{1}{3}(2m + 4)\)  
41. \(2(a + 8) + 7 = 5(a + 2) - 3a - 19\)
XII. Power Rules

65. \((-6)^0 = \) \[\text{_________}\]

66. \(c^4 \cdot c^2 \cdot c = \) \[\text{_________}\]

67. \((-4x^3)(-5x^7) = \) \[\text{_________}\]

68. \((n^2)^5 = \) \[\text{_________}\]

69. \((7x^6)^2 = \) \[\text{_________}\]

70. \((-5n)^3 = \) \[\text{_________}\]

71. \((4ab^2)(b^5) = \) \[\text{_________}\]

72. \((-18m^3n)^2 \left(\frac{1}{6}mn^2\right) = \) \[\text{_________}\]

73. \(\frac{6^3}{6^1} = \) \[\text{_________}\]

74. \(\frac{-2y^7}{14y^2} = \) \[\text{_________}\]

75. \(\frac{-6m}{15m^5} = \) \[\text{_________}\]

76. \(\frac{x^3y^4}{xy^7} = \) \[\text{_________}\]

77. \(\left(\frac{2}{5}\right)^3 = \) \[\text{_________}\]

78. \(\left(-\frac{3}{7}\right)^2 = \) \[\text{_________}\]

79. \(\left(\frac{4a^2b^4}{ab}\right)^{\frac{1}{2}} = \) \[\text{_________}\]

80. \(5^{-2} = \) \[\text{_________}\]

81. \((3x)^3 = \) \[\text{_________}\]

82. \(\frac{g^{-7}}{g^4} = \) \[\text{_________}\]

83. \(\left(\frac{5}{3}\right)^2 = \) \[\text{_________}\]

84. \(\frac{15x^6y^8}{5xy^{-11}} = \) \[\text{_________}\]
XIII. Representing Data

1. Create a stem-and-leaf plot, a box plot, and a dot plot for the following quiz scores.

   25 10 11 25 13 26 32 27 10 20 15 25 15

   Stem-and-leaf plot:  
   Box and Whiskers Plot:

   Dot plot:

2. What are the following statistics for the data?

   Mean: ____________

   Range: ____________

   First Quartile (Q1): ______________

   Median: ______________

   Third Quartile (Q3): ______________

   Mode: ______________

   Interquartile Range (IQR): __________