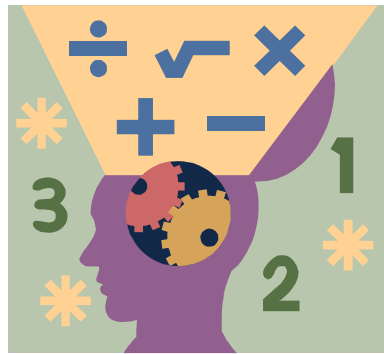# Grade 8 Summer Math Packet

McGlynn Middle School
Medford, MA 02155

If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is.
-John Louis von Neumann

McGlynn Middle School
3002 Mystic Valley Parkway
Medford, MA 02155

June 2011

Dear Parents/Guardians,

In an effort to enhance student success in math class in the upcoming school year, we are asking for your help in completing the summer math packet. Math is a cumulative discipline where each course builds upon previously learned concepts; therefore, it is necessary to continually review and refine these skills. Math packets have been aligned to the *Massachusetts Department of Elementary and Secondary Education Curriculum Frameworks.*

Students are being asked to complete the packet by the beginning of the school year. This is a required assignment and it will be up to each individual teacher to decide how it will be incorporated into his/her grading policy. We strongly recommend developing a plan to complete the packet periodically throughout the summer months, rather than waiting until the last week of the summer to complete it in its entirety.

Math packets can be picked up in the main office or printed out from the McGlynn Middle School website. Please join us as we work to ensure your child's mathematical success. Thank you for your assistance in this worthwhile endeavor and have a wonderful summer!

Regards,
Mr. Dan Harrington
Ms. Carin Lee
Grade 8 Math Teachers

Topic: **Adding and Subtracting Integers**   **Name:**
Standards: *8.N.8, 8.N.10, 8.N.12*   **Date:**

Adding Integers:
Rule 1:
The sum of two or more positive integers is a positive integer.
The sum of two or more negative integers is a negative integer.

Rule 2:
To find the sum of a positive and a negative integer:
Subtract the two numbers (ignore the signs) and then keep the sign of the larger integer.

Subtracting Integers:
Add the opposite, or copy-change-change.

Find the sum or difference.

1. $^-14 + {}^-44$	2. $23 + (-17)$	3. $^-13 - {}^-2$
4. $49 - 17$	5. $^-33 - 28$	6. $^-8 - {}^-18$
7. $19 - {}^-16$	8. $^-1 + 44$	9. $16 + {}^-12$
10. $^-45 - {}^-35$	11. $35 - 11$	12. $^-39 - {}^-11$
13. $4 - 4$	14. $27 + {}^-31$	15. $6 + 6$
16. $22 + 16$	17. $^-27 + {}^-17$	18. $^-26 - {}^-7$
19. $46 + 21$	20. $26 - 38$	21. $^-15 - 44$
22. $41 - 33$	23. $33 - {}^-10$	24. $^-22 - {}^-34$
25. $47 + {}^-17$	26. $32 - {}^-46$	27. $37 - 38$
28. $24 + {}^-40$	29. $24 + 40$	30. $^-18 - {}^-49$
31. $32 + {}^-25$	32. $28 + {}^-29$	33. $^-6 + 4$
34. $12 - {}^-3$	35. $14 - 43$	36. $8 + {}^-32$
37. $^-11 + 49$	38. $^-49 + {}^-21$	39. $^-39 - {}^-41$
40. $^-24 - 17$	41. $29 + 35$	42. $49 - 26$
43. $49 + {}^-27$	44. $2 - {}^-38$	45. $^-16 + 11$
46. $^-29 + 47$	47. $5 - {}^-8$	48. $^-34 - 46$

Topic: **Multiplying and Dividing Integers**   **Name:**
Standards: *8.N.1, 8.N.10, 8.N.12*   **Date:**

Rules for Multiplying and Dividing Integers:
- ❑ The product or quotient of *two* numbers with the **same** sign is **positive**.
- ❑ The product or quotient of *two* numbers with **different** signs is **negative**.

Examples:

$4 \bullet -2 = -8$ $\qquad\qquad$ $-4 \bullet -2 = 8$ $\qquad\qquad$ $\dfrac{-4}{2} = -2$

Find each product or quotient.

1. $4 \bullet 7$ $\qquad\qquad$ 2. $-4 \bullet 7$ $\qquad\qquad$ 3. $-4 \bullet -7$

4. $4 \bullet -7$ $\qquad\qquad$ 5. $12 \bullet (-3)$ $\qquad\qquad$ 6. $5 \bullet (-25)$

7. $\dfrac{30}{5}$ $\qquad\qquad$ 8. $\dfrac{-72}{-8}$ $\qquad\qquad$ 9. $\dfrac{48}{-12}$

10. $100 \div (-5)$ $\qquad\qquad$ 11. $-44 \div (-2)$ $\qquad\qquad$ 12. $-21 \div 3$

13. $7 \bullet (-5)$ $\qquad\qquad$ 14. $-24 \div (-6)$ $\qquad\qquad$ 15. $-80 \bullet 2$

16. $\dfrac{152}{-4}$ $\qquad\qquad$ 17. $\dfrac{-45}{-9}$ $\qquad\qquad$ 18. $-9 \bullet 8$

19. $(-16) \bullet (-3)$ $\qquad\qquad$ 20. $84 \div 12$ $\qquad\qquad$ 21. $-160 \div 16$

22. $-9 \bullet (-12)$ $\qquad\qquad$ 23. $\dfrac{-48}{6}$ $\qquad\qquad$ 24. $33 \div (-3)$

Topic: **Multiplying Fractions and Mixed Numbers** $\qquad$ **Name:**
Standards: *8.N.1, 8.N.10* $\qquad\qquad\qquad\qquad\qquad$ **Date:**

Follow these steps to multiply fractions and mixed numbers.
- ❑ Write the mixed numbers as improper fractions if necessary.
- ❑ Multiply numerators. Multiply denominators.
- ❑ Simplify, if necessary.

Find each product. Write the product in simplest form.

1. $\dfrac{1}{5} \bullet \dfrac{2}{3}$

2. $\dfrac{1}{4} \bullet 4\dfrac{1}{8}$

3. $2\dfrac{3}{4} \bullet 1\dfrac{2}{3}$

4. $\dfrac{5}{8} \bullet \dfrac{2}{5}$

5. $\dfrac{2}{3} \bullet 9$

6. $\dfrac{5}{12} \bullet \dfrac{3}{10}$

7. $\dfrac{3}{4} \bullet 1\dfrac{4}{5}$

8. $\dfrac{1}{2} \bullet 5\dfrac{1}{6}$

9. $\dfrac{2}{5} \bullet \dfrac{1}{4}$

10. $2 \bullet \dfrac{3}{4}$

11. $5\dfrac{1}{2} \bullet 2\dfrac{2}{3}$

12. $\dfrac{5}{6} \bullet 3\dfrac{3}{5}$

13. $\dfrac{2}{3} \bullet \dfrac{1}{7}$

14. $\dfrac{1}{2} \bullet \dfrac{2}{3}$

15. $2\dfrac{5}{7} \bullet 1\dfrac{1}{3}$

Topic: Dividing Fractions and Mixed Numbers   **Name:**
Standards: 8.N.1, 8.N.9, 8.N.10   **Date:**

Remember, to find the <u>reciprocal</u> of a fraction, <u>flip</u> the fraction. In other words, the numerator becomes the denominator and the denominator becomes the numerator.

Follow these steps to divide fractions and mixed numbers.
- ❑ Rewrite mixed numbers as improper fractions as needed.
- ❑ Change the division sign to a multiplication sign and take the reciprocal of the second fraction.
- ❑ Multiply numerators. Multiply denominators.
- ❑ Simplify, if necessary.

Find the reciprocal of each number.

1. $\dfrac{7}{8}$ 　　　　　　 2. $\dfrac{1}{6}$ 　　　　　　 3. $1\dfrac{1}{2}$ 　　　　　　 4. 5

Find each quotient. Write the quotient in simplest form.

5. $\dfrac{1}{5} \div \dfrac{1}{2}$ 　　　　 6. $\dfrac{3}{8} \div \dfrac{2}{3}$ 　　　　 7. $8 \div \dfrac{4}{5}$

8. $6 \div \dfrac{3}{4}$ 　　　　 9. $1\dfrac{1}{8} \div 2\dfrac{2}{5}$ 　　　　 10. $3\dfrac{1}{5} \div 2\dfrac{2}{3}$

11. $\dfrac{2}{3} \div \dfrac{3}{8}$ 　　　　 12. $10 \div \dfrac{7}{8}$

Topic:　　Order of Operations　　　　　　　　　**Name:**
Standards:　*8.N.1, 8.N.7, 8.N.12*　　　　　　　　**Date:**

Follow these steps to solve problems using the order of operations.
- ❏ Simplify inside grouping symbols (parenthesis).
- ❏ Simplify exponents.
- ❏ Simplify multiplication and division from left to right.
- ❏ Simplify addition and subtraction from left to right.

Solve each problem using the order of operations. <u>Show all work on separate paper.</u>

1. $(7 \times 5^2 - 7^2) \times 4$

2. $6 + (9 - 5 - 2)$

3. $9^2 - (2 - 5^2 - 2)$

4. $(1 - 6^2 \div 6^2 + 3 + 2)$

5. $(1^2 - 1) \times 5 + 6$

6. $(8 \times 4) - 3 \times 5$

7. $(5^2 - 4^2) - 7$

8. $9^2 + (5^2 \div 5) \div 1 + 2$

9. $(6 \times 5 - 7)$

10. $(5 - 5 \times 1)$

11. $(2^2 + 6 + 2) + 5^2 - 8$

12. $2^2 + (3 \times 3) \times 2$

13. $(3 + 2 \div 2)$

14. $(3 \times 4 - 4)$

15. $(4 \div 1) - (6 - 9) \div 1$

16. $(9 + 3 + 1)$

17. $(9 + 1) - 5$

18. $(6 \div 1^2) - 7 + 7$

19. $(1 + 4^2 + 6^2 - 3)$

20. $(8^2 + 1 + 6)$

Topic: Measures of Central Tendency   **Name:**
Standards: *8.N.1, 8.D.2, 8.D.3*   **Date:**

Remember:

Mean – the *average* of a set of numbers
Median – the *middle number* in a set of numbers
Mode – the number (or numbers) that occurs *most often* in a set of numbers
Range – the *difference* between the *greatest* and *least* values in a set of numbers

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The coach for the All-Star Basketball Game needs to pick one of two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Jim Geltz	18, 32, 28, 18, 14, 28, 10, 16, 36, 20
Diego Luna	22, 17, 23, 8, 24, 24, 22, 20, 18, 22

a. Find the **mean** (average) number of points scored by each player. **Show or describe how you found the means.**

b. Find the **median** number of points scored by each player. Make a stem-and-leaf-plot to help organize the data. **Show or describe how you found the medians.**

c. Find the **mode** for each player. **Describe how you found the mode.** *(Reminder, there can be no mode, one mode, or several modes.)*

d. Find the **range** for each player. **Show or describe how you found the range.**

e. Based on the data, which player would you recommend to the all-star team? **Justify** your recommendation with a comparison of the statistics. *(Answer on the back of this sheet.)*

Topic: **Solving Proportions**   **Name:**
Standards: *8.N.3, 8.M.4*   **Date:**

Proportion – an equation stating that two ratios are equal
If two ratios form a proportion, the cross products are equal.

To solve for a missing value in a proportion:
- ❑ Write the cross products.
- ❑ Solve the equation.

Example:

$$\frac{5}{15} = \frac{n}{3}$$
$$5 \cdot 3 = 15 \cdot n$$
$$15 = 15n$$
$$n = 1$$

Solve each proportion. Show all work.

1. $\dfrac{4}{24} = \dfrac{n}{6}$

2. $\dfrac{30}{5} = \dfrac{6}{n}$

3. $\dfrac{n}{6} = \dfrac{27}{9}$

4. $\dfrac{50}{70} = \dfrac{n}{7}$

5. $\dfrac{14}{7} = \dfrac{6}{n}$

6. $\dfrac{n}{15} = \dfrac{2}{5}$

7. $\dfrac{4}{10} = \dfrac{n}{15}$

8. $\dfrac{4}{200} = \dfrac{n}{100}$

9. $\dfrac{6}{n} = \dfrac{5}{10}$

10. $\dfrac{32}{22} = \dfrac{96}{n}$

11. $\dfrac{6}{3} = \dfrac{n}{5}$

12. $\dfrac{2}{n} = \dfrac{4}{10}$

Topic: **Area of Rectangles**   **Name:**
**Standard:** *8.M.3*   **Date:**

To find the area of a rectangle, use the formula $A = l \bullet w$. **Express all answers in square units and show all work.**

6 mm

9 mm

10 cm

4 cm

60 m

50 m

6 m
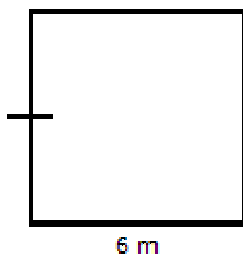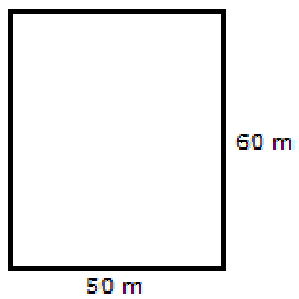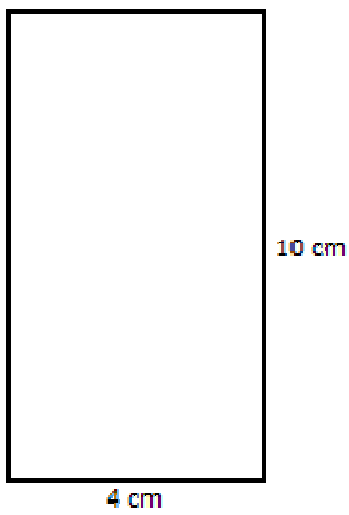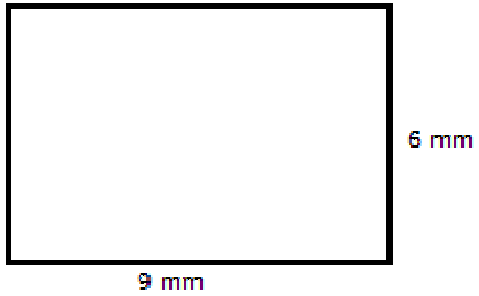
Topic: **Area of Triangles and Circles**   **Name:**

Standard: *8.M.3*   **Date:**

To find the area of a triangle, use the formula $A = \dfrac{1}{2}bh$**. To find the area of a circle,**

use the formula $A = 3.14r^2$**. All answers should be expressed in square units and make sure to <u>show all work</u>. Round answers to the nearest tenths place.**

15 cm

50 cm

20 cm

35 cm

1.5 cm

6 cm

3 cm

5 cm

7 cm

2 cm

5 cm

12 cm
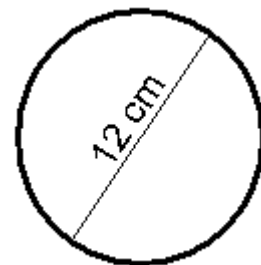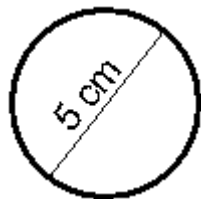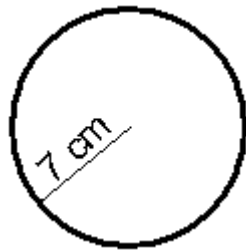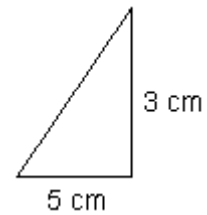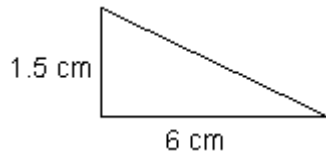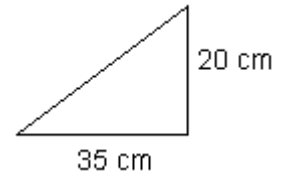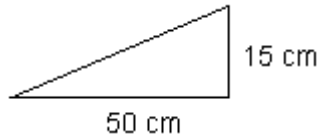
Topic: Volume
Standards: *8.G.7, 8.M.3*

Name:
Date:

Remember the formulas:

Volume of a rectangular prism	$V = l \bullet w \bullet h$
Volume of a cylinder	$V = Bh$ (B = base area or $3.14r^2$)
Volume of a pyramid	$V = \dfrac{1}{3} Bh$ (B = base area or $\dfrac{1}{2}bh$)

Find the volume of each figure. Your answer should be expressed in cubic inches. Show all work.

Radius = 6

Diameter = 5

12