Newtown Middle School
Summer Math Problems
Students Entering 8th Grade

Dear Parents and Students,

Summer is a wonderful opportunity for students to build their math skills and prepare themselves for their next mathematics course. Students are encouraged to complete 3-5 problems each week and then review their solutions with a parent, guardian, or another capable family member. All problems are aligned to the Connecticut Core Standards for Mathematics.

While you are reviewing the problems, think about the concept and not just the process. Show your thinking by writing out your work. Below are some questions that you should ask yourself:

1. Does my answer make sense?
2. Are there other ways to solve this problem?
3. Why does my mathematics procedure work?
4. How is this used in the real world?

In addition to these problems, please practice your skills by exploring the following websites:

Math Tutorials:
www.kahnacademy.com
http://patrickjmt.com/
http://www.artofproblemsolving.com/videos

Practice Problems & Games:
https://www.tenmarks.com/consumer/signup
http://www.arcademics.com/
http://www.hoodamath.com/index.html
http://www.pbslearningmedia.org/collection/mathcore/
http://www.math-play.com/Middle-School-Math-Games.html

Have a wonderful summer!

Sincerely,

The Newtown Middle School Mathematics Department

Name_____

Summer Skills Practice for Students Entering 8th Grade (2015 – 2016)

Directions: Please complete WITHOUT the use a calculator. At the bottom of each page, an answer bank has been provided to use as a guide to check your work.

1. Write an algebraic expression that models the word phrase: two less than five times a number

2. Write an algebraic expression that models the word phrase: five more than half a number

3. Write an algebraic expression that models the word phrase: the quotient of five and two times a number

4. Find the sum. $-18+22$

5. Find the sum. $-9+(-7)$

6. Find the sum. $26+(-4)+(-9)$

7. Find the sum. $-18+11+(-5)$

8. Find the difference. $6-28$

9. Find the difference. $10-(-14)$

10. Find the difference. $-3-(-17)$

11. Evaluate. $32-12\div2\cdot3+6$

12. Evaluate. $\left[8-\left(16\div4-3\right)+5\right]^{2}$

13. Evaluate $7+3(n-4)$, when $n=11$.

14. Evaluate $2m+10n$, when $m=8$ and $n=12$

15. Find the product. $(4)(-8)(5)$

16. Find the product. $(10)(-9)(-3)$

17. Evaluate $14-2(x+5)$, when $x=6$.

18. Evaluate $7a+4b$, when $a=3$ and $b=-6$.

19. Evaluate $\dfrac{5x}{y}+2xy$, when $x=-3$ and $y=-5$.

20. Evaluate each of the following.

   a. $|-18|$

   b. $|2-10|$

   c. $-|-11|$

   d. $|-18-5|$

   e. $9+|-20|$

ANSWER BANK FOR PROBLEMS 1 – 20(a-e).

-160	-22	-16	-12	-11	-8
-3	$\dfrac{1}{2}n+5$	4	$\dfrac{5}{2n}$	$5n-2$	8
13	14	18	20	23	24
28	29	33	136	144	270

21. Becky runs a business dog-sitting for her neighbors' dogs while they are away on vacation. The table below shows Becky's earnings for the months of April, May, June, July, August, and September.

Museum Visitors	
Month	**Earnings (Dollars)**
April	120
May	55
June	40
July	450
August	320
September	75

a. Find the mean value of Becky's earnings

b. Find the median value of Becky's earnings

c. Find the mode value of Becky's earnings

d. Find the range in values of Becky's earnings

22. Write each of the following numbers in scientific notation.

a. 14,300,000

b. 0.00143

23. Write each of the following numbers in standard form.

a. 2.9×10^3

b. 2.9×10^{-6}

24. Find the value of n for each of the following equations.

a. $75,400 = 7.54 \times 10^n$

b. $2.7 \times 10^n = 270,000,000$

c. $0.058 = 5.8 \times 10^n$

For problems 25 – 33, solve using the algebraic process.

25. Solve. $x - 23 = 112$

26. Solve. $14 = -16 + f$

27. Solve. $-18 = x - 3$

28. Solve. $t + 12 = 3$

29. Solve. $2x = 28$

30. Solve. $-6 = -30n$

31. Solve. $18 = \dfrac{2}{3}x$

32. Solve. $\dfrac{w}{-2} = 8$

33. Solve. $\dfrac{h}{6} = 24$

ANSWER BANK FOR PROBLEMS 21 – 33.

No mode	-16	-15	-9	-2
0.0000029	$\dfrac{1}{5}$ or 0.2	1.43×10^{-3}	1.43×10^7	4
8	14	27	30	97.5
135	144	$176.\overline{6}$	410	2900

35. Write each decimal as a fraction in simplest form.

    a. 0.72

    b. 2.4

    c. −0.005

36. Order the following rational numbers from least to greatest.

$$\frac{9}{12}, \quad -\frac{4}{5}, \quad \frac{3}{20}, \quad \frac{4}{6}, \quad \frac{2}{5}$$

    What is the median value?

37. Find the sum. $\quad 4\frac{1}{5} + 2\frac{3}{4}$

38. Find the difference. $8\frac{7}{8} - 2\frac{2}{3}$

39. Find the sum. $\quad 3\frac{7}{8} + 3\frac{5}{6}$

40. Find the difference. $9\frac{1}{6} - 1\frac{3}{4}$

41. Find the product. Write answer in simplest form. $\quad \frac{8}{9} \cdot \frac{6}{22} \cdot \frac{33}{40}$

42. Find the product. Write answer in simplest form. $\quad \frac{2}{3} \cdot \left(-2\frac{2}{5}\right)$

43. Find the quotient. Write answer in simplest form. $\quad \frac{2}{3} \div \frac{6}{7}$

44. Find the quotient. Write answer in simplest form. $\quad 1\frac{3}{5} \div 2\frac{1}{2}$

45. Sydney is making cookies for her teammates on the track team. If the recipe that she is following calls for $2\frac{1}{4}$ cups flour and makes 3 dozen cookies, how many cups of flour would she need to make 48 cookies?

46. Find the quotient. $24.96 \div 12$

47. Find the quotient. $1.519 \div 49$

48. Find the quotient. $2.892 \div .04$

49. What is 8% of 12?

50. 20 is 160% of what number?

51. 12 is what percent of 32?

52. Find the **simple interest** paid on a loan of $450 at 6% for 3 years.

ANSWER BANK FOR PROBLEMS 34 – 52.

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$-1\frac{3}{5}$ or $-\frac{8}{5}$	$-\frac{1}{200}$	0.031	$\frac{1}{5}$	$\frac{2}{5}$
$\frac{16}{25}$	$\frac{18}{25}$	$\frac{7}{9}$	0.96	2.08
$2\frac{2}{5}$ or $\frac{12}{5}$	3	$6\frac{5}{24}$	$6\frac{19}{20}$	$7\frac{5}{12}$
$7\frac{17}{24}$	12.5	37.5%	72.3	81

Challenging!

53. Find the **final balance** in your savings account after 24 months if you start with $1000 and your money earns 1.3% simple interest per year.

54. Evan buys an $80 tennis racquet. Since CT sales tax is 6.35%, what is the **total cost** of the tennis racquet?

55. Eighty-five percent of the students in Montvale School ride the bus to school in the morning. If there are 1300 students in the school, how many students ride the bus to school?

56. 12% of the students enrolled at a certain high school are participating in the school musical. Some students are the main performers and others are in the chorus. Even more of the students are in the pit orchestra. Almost half are in the crew. If 108 students are participating in the musical, how many students are enrolled in the school?

57. The original cost of a plane ticket is $335. The sale price is $195. Find the **percent of discount** *(round your answer to the nearest tenth)*.

58. C.J. bought a new elliptical machine on sale for $2210 . If this was after a 15% discount, what was the **original price?**

59. A builder is installing a circular window in the cabin of a ship. If the window has a diameter of 14 inches, how many square inches of glass will be needed? Use $\dfrac{22}{7}$ as an approximation for π and $A = \pi\, r^2$. (in square inches)

60. The two circles in the figure below are congruent. Each has a radius of 10 mm. Find the area of the shaded region in the figure below (in mm^2). *(Use 3.14 for π)*
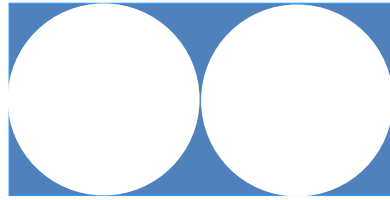
61. A circle has a circumference of 24π inches. Find the radius of the circle. (in inches)

62. If one angle in a pair of vertical angles measures 36°, and the other measures $(5x - 4)°$, find the value of x.

63. Find the value of x in the diagram below.

$(3x)°$ $88°$ $(4x - 6)°$
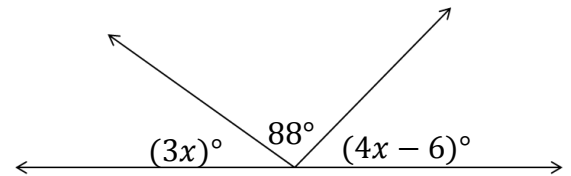
64. Find the volume of the figure below. (in cm^3) *(Not drawn to scale)*

10 cm

5 cm

7 cm
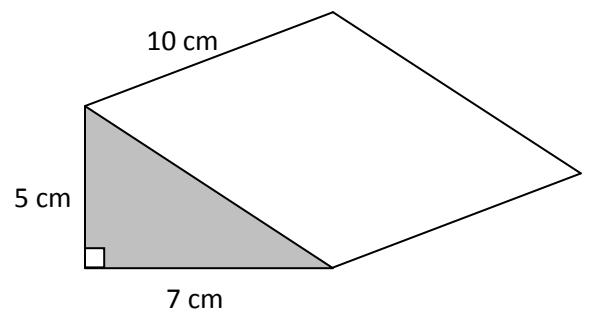
ANSWER BANK FOR PROBLEMS 53 – 64.

8	12	14	41.8	$85.08	154
172	175	900	$1026	1105	$2600

65. Solve. $3h + 4 = 28$

66. Solve. $15 = 6x - 9$

67. Solve. $6x + 13 = -5$

68. Solve. $-4m - 12 = -20$

69. Solve. $30 = 24 + \frac{n}{4}$

70. Solve $\frac{x}{3} + 13 = -5$

71. Solve. $-18 = \frac{5}{7}x - 23$

72. Simplify. $5x + 2 - 8x + 4$

73. Simplify. $-2(6x - 4)$

74. Simplify. $3(2x - 5) + 6(x + 3)$

75. Solve. $3x + 7 + 2x = 2$

Most Challenging!!!

76. Simplify. $-3\frac{1}{4} + 5\frac{2}{3}$

77. Simplify. $-4\frac{1}{8} + \left(-7\frac{3}{4}\right)$

78. Simplify. $10\frac{5}{6} - \left(-3\frac{1}{2}\right)$

79. Simplify. $2\frac{1}{3} - 8\frac{3}{5}$

80. Simplify. $-12\frac{4}{5} - 7\frac{1}{3}$

81. Simplify. $6\frac{7}{8} - 9\frac{1}{4}$

82. Simplify. $\frac{1}{2} - \frac{2}{3} + \frac{5}{6} - \frac{3}{4}$

83. Simplify $-3\frac{1}{2} + \left(-6\frac{2}{3}\right) + 1\frac{1}{4} + \left(-2\frac{5}{6}\right)$

84. Simplify $5 + 2(4x - 3)$

85. Solve. $3(4x - 1) = -1$

86. Solve. $26 = 2(3x + 4)$

87. Solve. $\frac{5x-8}{12} = \frac{1}{2}$

88. Solve. $7x - 3 = 4x + 12$

89. Solve. $-2m = 4 - 20m$

90. Solve. $7t - 10 = 5t + 8 - 2t$

91. Solve. $\frac{3}{4}x + 4\frac{2}{5} = 8\frac{1}{2}$

92. Solve. $-6\frac{4}{5} = \frac{1}{5}h - 3\frac{1}{3}$

93. Solve. $\frac{3}{5}x + \frac{7}{10} = \frac{11}{15}x - \frac{2}{5}$

94. Solve. $7 - 3(2x - 2) = 25$

ANSWER BANK FOR PROBLEMS 65 – 94.

-54	$-20\frac{2}{15}$	$-17\frac{1}{3}$	$-12x+8$	$-11\frac{7}{8}$	$-11\frac{3}{4}$
$-6\frac{4}{15}$	-3	$-3x+6$	$-2\frac{3}{8}$	-2	-1
$-\frac{1}{12}$	$\frac{1}{6}$	$\frac{2}{9}$	2	$2\frac{5}{12}$	$2\frac{4}{5}$
3	4	$4\frac{2}{15}$	$4\frac{1}{2}$	5	7
8	$8x-1$	$8\frac{1}{4}$	$12x+3$	$14\frac{1}{3}$	24