

Math Team Grade 7

In order to be successful in the math team class you should be able to do the following BEFORE you begin 7th grade

- Understand how to work each of the problems on the tournament test
- Understand how to work each of the problems on the Warm Ups 1 through 3 and Workout 1
- Convert from base 10 to other bases
- Convert from other bases to base 10
- Write numbers in scientific notation
- Write numbers in standard form
- Multiply and divide numbers in scientific notation
- Change repeating decimals to fractions
- Convert back and forth from fractions, to decimals, to percents
- Compute operations with integers (add, subtract, multiply, divide positive and negative numbers)
- Understand geometry terms (compliment, supplement, # of degrees in a figure)
- Calculate absolute value
- Metric Units and Customary Units
- Measures of Central Tendency (mean, median, mode, range)

TTK Quiz - SECOND DAY of SCHOOL!!

Math Team Grade 7 - Things to Know

Be prepared to take a quiz on this material the **SECOND DAY** of school
Write each as a percent, decimal, and fraction.

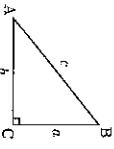
$\frac{1}{2} = 50\%$ $\frac{1}{3} = 33\frac{1}{3}\%$ $\frac{2}{3} = 66\frac{2}{3}\%$ $\frac{1}{4} = 25 = 25\%$ $\frac{3}{4} = 75 = 75\%$
 $\frac{1}{5} = 20\%$ $\frac{2}{5} = 40\%$ $\frac{3}{5} = 60\%$ $\frac{4}{5} = 80\%$

$\frac{1}{6} = 16\frac{2}{3}\%$ $\frac{5}{6} = 83\frac{1}{3}\%$
 $\frac{1}{8} = 12.5 = 12\frac{1}{2}\%$ $\frac{3}{8} = 37.5 = 37\frac{1}{2}\%$ $\frac{5}{8} = 62.5 = 62\frac{1}{2}\%$ $\frac{7}{8} = 87.5 = 87\frac{1}{2}\%$

$\frac{1}{9} = 11\frac{1}{9}\%$ $\frac{2}{9} = 22\frac{2}{9}\%$ $\frac{4}{9} = 44\frac{4}{9}\%$ etc.
 $\frac{1}{12} = 0.8\bar{3} = 8\frac{1}{3}\%$ $\frac{5}{12} = 41\frac{2}{3}\%$ $\frac{7}{12} = 58\frac{1}{3}\%$ $\frac{11}{12} = 91\frac{2}{3}\%$

Pythagorean Theorem : $a^2 + b^2 = c^2$

- Triples:**
 3, 4, 5 9, 40, 41
 5, 12, 13 11, 60, 61
 7, 24, 25 20, 21, 29
 8, 15, 17



Polygons	# of sides	# of angles	# of vertices	# of diagonals
Triangle	3	3	3	0
quadrilateral	4	4	4	2
pentagon	5	5	5	5
hexagon	6	6	6	9
heptagon	7	7	7	14
octagon	8	8	8	20
nonagon	9	9	9	27
decagon	10	10	10	35
dodecagon	12	12	12	54
icosagon	20	20	20	170

Exponents

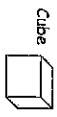
$0^2 = 0$	$1^2 = 1$	$2^2 = 4$	$3^2 = 9$	$4^2 = 16$	$5^2 = 25$	$6^2 = 36$
$7^2 = 49$	$8^2 = 64$	$9^2 = 81$	$10^2 = 100$	$11^2 = 121$	$12^2 = 144$	$13^2 = 169$
$14^2 = 196$	$15^2 = 225$	$16^2 = 256$	$17^2 = 289$	$18^2 = 324$	$19^2 = 361$	$20^2 = 400$
$21^2 = 441$	$25^2 = 625$	$30^2 = 900$	$35^2 = 1225$	$40^2 = 1600$	$45^2 = 2025$	$55^2 = 3025$
$65^2 = 4225$	$1^3 = 1$	$2^3 = 8$	$3^3 = 27$	$4^3 = 64$	$5^3 = 125$	$6^3 = 216$
$7^3 = 343$	$8^3 = 512$	$9^3 = 729$	$10^3 = 1000$	$11^3 = 1331$	$12^3 = 1728$	$20^3 = 8000$

Square Roots and Cube Roots

$\sqrt{4} = 2$ $\sqrt{9} = 3$ $\sqrt{16} = 4$ $\sqrt{25} = 5$ $\sqrt{36} = 6$ $\sqrt{49} = 7$ $\sqrt{64} = 8$ $\sqrt{81} = 9$
 $\sqrt{100} = 10$ $\sqrt{121} = 11$ $\sqrt{144} = 12$ $\sqrt{169} = 13$ $\sqrt{196} = 14$ $\sqrt{225} = 15$ $\sqrt{256} = 16$
 $\sqrt{289} = 17$ $\sqrt{324} = 18$ $\sqrt{361} = 19$ $\sqrt{400} = 20$ $\sqrt{4} = 2$ $\sqrt[3]{27} = 3$ $\sqrt[3]{64} = 4$
 $\sqrt[3]{125} = 5$ $\sqrt[3]{216} = 6$ $\sqrt[3]{343} = 7$ $\sqrt[3]{512} = 8$ $\sqrt[3]{729} = 9$ $\sqrt[3]{1000} = 10$

Formulas

- Circle: circumference = $2\pi r$ or πd area = πr^2 $\pi = 3.14$ or $22/7$
- Triangle: area = $\frac{1}{2}bh$ perimeter $a + b + c$
- Square: area = s^2 perimeter $4s$
- Rectangle: area = lw perimeter = $2l + 2w$
- Trapezoid: area = $\frac{1}{2}h(b_1 + b_2)$
- Parallelogram: area = bh



Volume = s^3
surface area = $6s^2$

Sphere

Volume = $\frac{4}{3}\pi r^3$
Surface Area = $4\pi r^2$

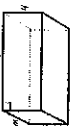


Volume = $\frac{1}{3}\pi r^2h$ Cylinder
surface area = $\pi rs + \pi r^2$



Volume = πr^2h
Surface Area = $2\pi r^2 + 2\pi rh$

Rectangular solid




volume = lwh
surface area = $2lw + 2wh + 2lh$


- Interest = prt (Interest = principal x rate x time)
- Distance = rt (distance = rate x time)
- Percent of change = change/original

Prime Numbers between 1 and 100: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149

Factorials

$0! = 1$	$1! = 1$	$2! = 2$	$3! = 6$	$4! = 24$	$5! = 120$
$6! = 720$	$7! = 5040$	$8! = 40320$	$9! = 362880$	$10! = 3,628,800$	$n! = 1 \times 2 \times 3 \times \dots \times n$

- 1.) Which of these numbers is the smallest?
 A. 0.42 B. $\frac{4}{10}$ C. $\frac{42}{50}$ D. $\frac{21}{50}$ E. NH
- 2.) Rebecca takes 30 minutes to cut a stick of bamboo into 6 pieces. How long does it take her to cut another stick into 8 pieces?
 A. 45 min B. 120 min C. 48 min D. 40 min E. NH
- 3.) Express the decimal sum as a reduced fraction.
 $0.2 + 1.105 + .055$
 A. B. C. D. E. NH
- 4.) Evaluate -
 A. 64 B. -64 C. 12 D. -12 E. NH
- 5.) What is the perimeter of a square if the area is 169?
 A. 52 cm B. 13 cm C. 42.25 cm D. 26 cm E. NH
- 6.) A rectangular prism has a length of 4.5 centimeters, a width of 2 centimeters, and a height of 1.5 centimeters. What is the surface area?
 A. 8 cm sq B. 13.5cm sq C. 18.75 cm sq D. 37.5 cm sq E. NH
- 7.) The distance from Birmingham to Mobile is 3.5 inches on a map. If the map scale is $\frac{1}{2}$ inch=30 miles, what is the distance in miles?
 A. 210 miles B. 21 miles C. 1.75 miles D. 10.5 miles E. NH
- 8.) A pizza recipe calls for 1 cup of sauce. If you tripled the recipe, how much sauce would you need? Express your answer as a decimal.
 A. 0.25 c B. 2.25 c C. 0.75 c D. 1.75 c E. NH
- 9.) Find x:

 A. 95° B. 280° C. 100° D. 90° E. NH

- 10.) Evaluate $x(y) - x + z$ if $x = 2$, $y = 3$, and $z = 10$
 A. -6 B. 14 C. 12 D. -18 E. NH
- 11.) Corey's dad gave him \$20. He also saves \$5 each week to buy video games. Write an inequality to find the number of weeks Corey must save, so that he has at least \$150.
 A. $20(5 + w) \geq 150$ B. $5w + 20 \leq 150$ C. $5w + 20 \geq 150$ D. $20 + 5 + w = 150$ E. NH
- 12.) Brady went to the mall with \$75. He spent \$5 on lunch, \$13 for a CD and \$12 at the arcade. What percent of his money was left?
 A. 40% B. 45% C. 75% D. 60% E. NH
- 13.) Last week Sara walked to Aby's house three times along a path that is 0.8 miles. She returned home each time on a shortcut that is three quarters of a mile. How many miles total did Sara walk?
 A. 1.55 B. 4.55 C. 3.15 D. 7.05 E. NH
- 14.) What is 30% of 2100?
 A. 30 B. 630 C. 63,000 D. 70 E. NH
- 15.) Find the positive difference of the perimeter and the area of the triangle.

 A. 5.5 B. 5.875 C. 5 D. 7.75 E. NH
- 16.) A tornado warning began at 11:45 p.m. one night and ended 3,480 seconds later. At what time did the warning end?
 A. 12:43 A.M. B. 12:43 P.M. C. 12:44 P.M. D. 12:44 A.M. E. NH
- 17.) What is the interquartile range of the data set?
 37, 47, 50, 44, 47, 38, 42, and 47
 A. 47 B. 39 C. 8 D. 10 E. NH

18.) A rectangular storage room is 21 feet long by 18 feet wide. Find the number of cubic feet of space the room occupies if it is 9 feet high.

- A. 342 B. 3,402 C. 387 D. 3,240 E. NH

19.) The length of a kitchen wall is $24\frac{2}{3}$ feet long. A border will be placed along the wall of the kitchen. If the border comes in strips that are each $1\frac{1}{4}$ feet long, how many strips of border are needed?

- A. 15 B. 14 C. 7 D. 8 E. NH

20.) What is the upper quartile of the given data set.

58,58,69,61,61,53,72,67,68,60,67

- A. 67 B. 69 C. 72 D. 68 E. NH

21.) Order from least to greatest. $\frac{1}{3}$; 33%; 0.8; $\frac{5}{6}$

- A. 33% ; $\frac{1}{3}$; 0.8 ; $\frac{5}{6}$
 B. $\frac{1}{3}$; 0.8 ; $\frac{5}{6}$; 33%
 C. 33% ; $\frac{1}{3}$; $\frac{5}{6}$; 0.8
 D. 33% ; $\frac{5}{6}$; $\frac{1}{3}$; 0.68
 E. NH

22.) Write an equation to represent the function represented in the table.

Input x	1	2	3	4	5
Output y	8	15	22	29	36

- A. $X =$ B. $y = x + 7$ C. $y = 7x + 1$ D. $y = 5x + 3$ E. NH

23.) Lori is filling a small pool in her yard. After 3 minutes and 15 seconds the pool is only full. If the pool can hold 300 gallons, how much longer will it take to fill the pool?

- A. 16 min 25 sec B. 16 min 15 sec C. 15 min 75 sec D. 3 hrs 15 min E. NH

24.) Cindy is making a quilt that is 48 inches wide by 72 inches long. He wants the entire quilt to be composed of a pattern of rectangles. If each rectangle is 8 inches wide and 12 inches long, how many rectangles will fit on the quilt?

- A. 432 B. 288 C. 36 D. 172.8 E. NH

25.) Maria has 64 flowers. She makes 8 bouquets with the flowers. How many bouquets of flowers will she have if she has 80 flowers?

- A. 8 B. 16 C. 640 D. 10 E. NH

TB1.) Find the mean absolute deviation for the set {34, 32,30,27,38}.

TB2.) The middle school is holding its annual awards banquet in the auditorium. In the first row, there are 10 seats. Each additional row has 4 more seats than the previous row. If there are a total of 8 rows how many seats are there?

TB3.) Laura can paint plywood at a rate of 3.2 square feet per minute. How many minutes does it take her to paint both sides of a 4 foot by 8 foot piece of plywood?

Changing decimals to fractions

$$.45 = \frac{45}{100} = \frac{9}{20}$$

$$3 = \frac{3}{100}$$

$$1.42 = \frac{142}{100} = \frac{71}{50}$$

Changing fractions to decimals

$$\frac{1}{10} = 0.1$$

$$\frac{7}{10} = 0.7$$

$$\frac{101}{1000} = .101$$

$$\frac{1}{5} = \frac{2}{10} = 0.2$$

$$\frac{3}{8} = \frac{375}{1000} = 0.375$$

$$8 = \frac{8000}{1000}$$

Adding fractions

Find common denominator then add numerators

$$\frac{1}{2} + \frac{1}{3} = \frac{2+3}{6} = \frac{5}{6}$$

$$\frac{1}{3} + \frac{2}{5} = \frac{5+10}{15} = \frac{13}{15}$$

$$\frac{1}{5} + \frac{2}{3} = \frac{3+10}{15} = \frac{13}{15}$$

$$\frac{1}{3} + \frac{1}{5} = \frac{4}{15}$$

$$\frac{1}{8} + \frac{1}{5} = \frac{5+8}{40} = \frac{13}{40}$$

Subtracting fractions

Find common denominator then subtract numerators

$$\frac{1}{2} - \frac{1}{3} = \frac{3-2}{6} = \frac{1}{6}$$

$$\frac{1}{3} - \frac{2}{5} = \frac{5-10}{15} = -\frac{5}{15} = -\frac{1}{3}$$

$$\frac{1}{5} - \frac{2}{3} = \frac{3-10}{15} = -\frac{7}{15}$$

Percent

Percent means out of 100

$$\frac{50}{100} = 50\%$$

$$\frac{1}{10} = 10\%$$

$$\frac{20}{100} = 20\%$$

$$\frac{75}{100} = 75\%$$

to find the % of a number, move the decimal to the right 2 places

$$60\% = 60 \div 100 = .60$$

$$115\% = 115 \div 100 = 1.15$$

$$72\% = .72$$

$$3\% = .03$$

Multiply fractions

$$\frac{1}{2} \cdot \frac{1}{3} = \frac{1 \cdot 1}{2 \cdot 3} = \frac{1}{6}$$

$$\frac{2}{3} \cdot \frac{3}{4} = \frac{2 \cdot 3}{3 \cdot 4} = \frac{6}{12} = \frac{1}{2}$$

$$\frac{1}{5} \cdot \frac{2}{3} = \frac{1 \cdot 2}{5 \cdot 3} = \frac{2}{15}$$

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

Dividing fractions

Flip and multiply

$$\frac{1}{2} \div \frac{1}{3} = \frac{1}{2} \cdot \frac{3}{1} = \frac{3}{2}$$

$$\frac{4}{3} \div \frac{2}{4} = \frac{4}{3} \cdot \frac{4}{2} = \frac{16}{6} = \frac{8}{3}$$

$$\frac{10}{8} \div \frac{20}{6} = \frac{10}{8} \cdot \frac{6}{20} = \frac{60}{160} = \frac{3}{8}$$

$$\frac{1}{3} \div \frac{2}{6} = \frac{1}{3} \cdot \frac{6}{2} = \frac{6}{6} = 1$$

Negative Numbers (Integers)

Adding - if signs are the same - add and keep the same sign

$$1 + 2 = 3$$

$$-1 + -2 = -3$$

$$5 + 6 = 11$$

$$-5 + -6 = -11$$

$$-5 + 6 = 1$$

$$5 + -6 = -1$$

Subtracting - if signs are different - subtract and take the larger sign

$$-5 + 3 = -2$$

$$7 + -1 = 6$$

$$-19 + 3 = -16$$

Subtracting - Change the subtraction sign to addition and change the 2nd sign to the opposite - then follow addition rules

$$-5 - 3 = -5 + -3 = -8$$

$$6 - -3 = 6 + 3 = 9$$

$$-7 - 3 = -7 + -3 = -10$$

Multiplication and Division

If the signs are the same = positive answer

$$-25 \div -5 = 5$$

$$25 \div 5 = 5$$

$$-5 \cdot -3 = 15$$

$$5 \cdot 3 = 15$$

If the signs are different = negative answer

$$-25 \div 5 = -5$$

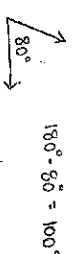
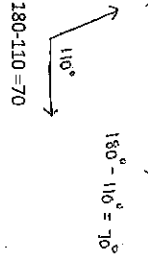
$$25 \div -5 = -5$$

$$-5 \cdot 3 = -15$$

$$5 \cdot -3 = -15$$

Supplement of an angle

(subtract from 180°)

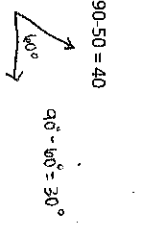
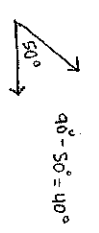


$$180 - 110 = 70$$

$$180 - 80 = 100$$

Complement of an angle

(subtract from 90°)

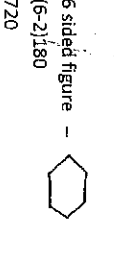
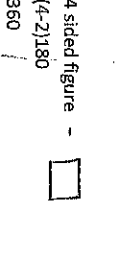
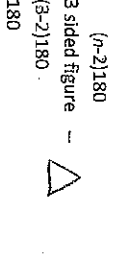


$$90 - 50 = 40$$

$$90 - 90 = 0$$

To find the number of degrees in a figure with n sides

$$(n-2) \cdot 180$$



Percent Equations

$$\frac{Is}{of} = \frac{\%}{100}$$

What is 25% of 50

$$\frac{Is}{25} = \frac{25}{100}$$

Use cross products to solve

$$50 \cdot 25 = 100x$$

$$125 = 100x$$

$$1.25 = x$$

Exponents (See TTK)

$$2^2 = 4$$

$$3^3 = 27$$

$$3^2 + 3^3 = 36$$

$$3^2 \cdot 3^3 = 3^5$$

$$4^0 = 1$$

$$5^1 = 5$$

$$a^0 = 1$$

Cross Multiply

$$\frac{12}{18} = \frac{x}{12}$$

$$12 \cdot 12 = 18x$$

$$144 = 18x$$

$$8 = x$$

Metric Units

1000 milliliters = 1 liter
 1000 Liters = 1 kiloliter
 Liters - capacity
 Grams - weight
 Meter - length

Milli means .001

Centi means .01

Kilo means 1000

x less than y is represented as y - x

Arrangements

Team = $4 \cdot 3 \cdot 2 \cdot 1 = 24$
 Chair = $5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$

Ways to arrange COLLEY

of letters = 6
 Ways to arrange MATHTEAM = $6! = 720$

of letters

Repeated letters = 212121
 $\frac{6!}{2!2!2!} = 120$

Central Tendencies

Mode = number that appears the most
 Mean = average
 Median = number in the middle once in numerical order
 Range = largest minus smallest
 Absolute value positive distance

$$|8| + |6 - 13|$$

$$8 + 7 = 15$$

Square Roots (see TTK)

$$\sqrt{16} = 4$$

$$\sqrt{121} = 11$$

$$\sqrt{64} = 8$$

$$\sqrt[3]{27} = 3$$

$$\sqrt[4]{64} = 2$$

Customary Units

8 fl oz = 1 cup
 2 cups = 1 pint
 2 pints = 1 quart
 4 quarts = 1 gallon

Distance

1 yard = 3 feet
 12 inches = 1 foot
 5,280 feet = 1 mile

Scientific Notation - a way to write numbers using powers of 10. You write a number in scientific notation as the product of the 2 factors.

Ex. 7, 500, 000, 000, 000 = 7.5×10^{12} (2nd factor is a power of 10)
 (1st factor is between 1 and 10)

Example 1: Write in scientific notation:

4,200,000 - move the decimal point to get a decimal between 1 and 10 (6 places left)

4.2 - Drop the zeros after the 2

4.2×10^6 - you moved the decimal point 6 places (left)

Use 6 as the exponent of 10

Example 2: Write in scientific notation

0.000079 - move the decimal point to get a number between 1 and 10 (5 places right)

7.9 - drop zeros before the 7

7.9×10^{-5} - You moved the decimal point 5 places (right)

Use -5 as the exponent of 10

Practice

A. Write each in standard form

- 1.) 8.9×10^5
- 2.) 8.94×10^7
- 3.) 6.0502×10^5
- 4.) 2.75×10^8
- 5.) 7.2×10^{-4}
- 6.) 1.2×10^{-6}

B. Write each in scientific notation

- 7.) 8,900,000,000
- 8.) 555,900,000
- 9.) 0.0056
- 10.) 0.000006
- 11.) 0.209
- 12.) 0.00000725

C. Order from least to greatest:

- 13.) $10^9, 10^{-8}, 10^5, 10^{-6}, 10^9$
- 14.) $16 \times 10^9, 2.3 \times 10^{12}, 0.065 \times 10^{11}$
- 15.) $253 \times 10^{-9}, 3.7 \times 10^{-8}, 12.9 \times 10^{-7}$

D. Multiply

- 16.) $(2.3 \times 10^5)(5 \times 10^7)$
- 17.) $(3 \times 10^2)(3.6 \times 10^{-8})$
- 18.) $(4.3 \times 10^{-3})(2 \times 10^{-8})$

E. Divide

- 19.) $\frac{2.17 \times 10^7}{7 \times 10^5}$
- 20.) $\frac{3.64 \times 10^{-3}}{4 \times 10^5}$

Base Number Practice

Example 1: Convert to base 10

$42324_5 = \underline{\hspace{2cm}}$ Pattern is multiply by the base then add.....

Begin by 42324_5 $4 \times 5 = 20$

next add 2 $20 + 2 = 22$

Then multiply by 5 and add the next number $22 \times 5 = 110$

$110 + 3 = 113$

Continue the pattern

$113 \times 5 = 565$

$565 + 2 = 567$

$567 \times 5 = 2835$

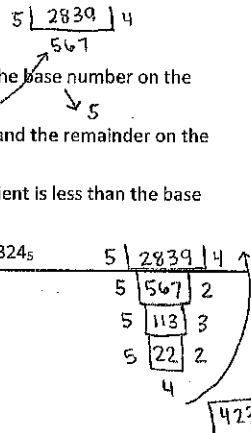
$2835 + 4 = 2839$

Answer 2839_{10}

Example 2: Converting from base 10

$2839_{10} = \underline{\hspace{2cm}}_5$

- Begin by drawing a box and placing the base number on the outside.
- Divide - putting the quotient below and the remainder on the right
- Continue the pattern until your quotient is less than the base number 5
- Read the answer from bottom up 42324_5



Converting to Base 10

- 1. $121_3 = \underline{\hspace{2cm}}_{10}$
- 2. $254011_6 = \underline{\hspace{2cm}}_{10}$
- 3. $101101_2 = \underline{\hspace{2cm}}_{10}$
- 4. $101101111_2 = \underline{\hspace{2cm}}_{10}$
- 5. $2530_6 = \underline{\hspace{2cm}}_{10}$
- 6. $123123123_4 = \underline{\hspace{2cm}}_{10}$
- 7. $1101101_2 = \underline{\hspace{2cm}}_{10}$
- 8. $1000000_2 = \underline{\hspace{2cm}}_{10}$

Converting from Base 10

- 1. $54 = \underline{\hspace{2cm}}_6$
- 2. $72 = \underline{\hspace{2cm}}_2$
- 3. $27 = \underline{\hspace{2cm}}_4$
- 4. $61050 = \underline{\hspace{2cm}}_9$
- 5. $76 = \underline{\hspace{2cm}}_9$
- 6. $726 = \underline{\hspace{2cm}}_5$
- 7. $12 = \underline{\hspace{2cm}}_2$
- 8. $1024 = \underline{\hspace{2cm}}_2$
- 9. $24 = \underline{\hspace{2cm}}_3$
- 10. $5280 = \underline{\hspace{2cm}}_8$
- 11. $36 = \underline{\hspace{2cm}}_6$
- 12. $324 = \underline{\hspace{2cm}}_2$

Repeating Decimals

Change the following decimals to fractions

Example 1: Change $0.\overline{45}$ to a fraction

Step 1 – count the number of digits under the repeat bar (4 and 5 – so there are 2)

Step 2 – Place the number under the repeat bar as your numerator. For every digit under the repeat bar, place a 9 in the denominator

$$\frac{45}{99}$$

Step 3 – Reduce $\frac{45}{99} = \frac{5}{11}$

Example 2: Change $2.\overline{64}$ to a fraction

Step 1 – Subtract any number not under the repeat bar from the entire decimal number to get your numerator. So subtract 2 from 264 to get 262

Step 2 – count the number of digits under the repeat bar (6 and 4 so there are 2). This is the number of 9's you will put in your denominator

Step 3 – Count the number of digits not under repeat bar – 2 so there is 1). This is the number of 0's you will put in your denominator

Step 4 – reduce

$$\frac{262 \div 2}{990 \div 2} = \frac{131}{495}$$

- 1) $0.\overline{5}$
- 2) $0.\overline{52}$
- 3) $0.\overline{6}$
- 4) $0.\overline{772}$
- 5) $0.\overline{45}$
- 6) $0.\overline{545}$
- 7) $0.2\overline{5}$
- 8) $0.3\overline{6}$
- 9) $0.7\overline{2}$

- 10) $0.12\overline{5}$
- 11) $0.87\overline{3}$
- 12) $0.89\overline{1}$
- 13) $0.62\overline{5}$
- 14) $0.77\overline{8}$
- 15) $0.52\overline{6}$
- 16) $7.\overline{6}$
- 17) $17.8\overline{2}$
- 18) $125.1\overline{52}$

Warm-Up 1



1. $\$$ _____
Yoselin purchases 3 dozen tomatoes for \$6.66. At this rate, how much will 10 dozen tomatoes cost?

2. _____ sq in
One square has a perimeter of 40 inches. A second square has a perimeter of 36 inches. What is the positive difference in the areas of the two squares?

3. _____ %
A standard six-sided die was rolled 50 times, and the outcomes are in the table shown. What percent of the rolls resulted in a prime number?

Outcome	# of Occurrences
1	14
2	5
3	9
4	7
5	7
6	8

4. _____ factors
How many factors of 1000 can be divided by 20 without a remainder?

5. _____ units
The square shown is divided into 4 congruent rectangles. If the perimeter of the square is 144 units, what is the perimeter of one of the four congruent rectangles?



6. _____
Two integers have a difference of -18 and a sum of 2. What is the product of the two integers?

7. _____
The median of a set of consecutive odd integers is 138. If the greatest integer in the set is 145, what is the smallest integer in the set?

8. _____ integers
Among all three-digit integers from 100 to 400, how many have exactly one digit that is an 8?



9. _____ games
Ben and Dan are two of the members on the school's chess team. In a tournament against their rival team, Ben played exactly 1 out of every 4 games. Dan, who played more games, played 14 games. What is the largest number of games the team could have played?

10. _____ miles
Peter Pedals rode his bike a total of 500 miles in five days. Each day he rode 10 more miles than he had ridden on the previous day. How many miles did Peter ride on just the fifth day?



Warm-Up 2

1. triangles A pattern of equilateral triangles will be made from matchsticks, as shown. One whole matchstick is used per side on each triangle. If the pattern is extended and uses exactly 77 matchsticks, how many triangles will be formed?



2. sq feet The ratio of the length of a rectangular room to its width is 5:3. The perimeter of the room is 48 feet. What is the area of the room?

3. What is the greatest perfect square that is a factor of 71?

4. A standard six-sided die with its faces numbered 1 to 6 is rolled once, and a dime is tossed once. What is the probability of rolling a number less than 3 and tossing a tail? Express your answer as a common fraction.

5. students In a recent survey of 300 students, 152 students had at least one dog, 120 students had at least one cat, and 46 students had at least one cat and at least one dog. How many of the surveyed students did not have either a cat or a dog?



6. points Alicia's average score on her five tests is 88 points. The score range for each test is 0 points to 100 points, inclusive. What is the lowest possible score that Alicia could have earned on one of the five tests?

7. units The numerical value of a particular square's area is equal to the numerical value of its perimeter. What is the length of a side of the square?

8. When converted to be in the same unit of measure, what is the ratio of 4 cm to 1 km? Express your answer as a common fraction.

9. years In 30 years, Sue will be 4 times as old as she is now. How old is she now?
old

10. sq inches A legal-sized piece of paper measures 8.5 inches by 14 inches. A one-inch border of paper is cut off from each of the four sides. How many square inches have been cut off?

Warm-Up 3

1. degrees Angles A and B are supplementary. If the measure of angle A is 8 times angle B, what is the measure of angle A?

2. In a certain sequence of numbers, each number after the first is 3 less than twice the previous number. If the third number in the sequence is 51, what is the first number of the sequence?

3. \$ Raymond buys items to sell in his store. He prices each item to be 25% more than the wholesale cost. What price should he put on an item with a wholesale cost of \$39.00?



4. mph



Starting at the town of Euler and traveling 40 miles to the town of Pythagoras, Rashid travels at the rate of 2 miles every 15 minutes. Returning from Pythagoras to Euler, he travels 2 miles every 3 minutes. What was Rashid's average speed, in miles per hour, for the entire trip? Express your answer as a mixed number.

5. units The ratio of the length of the sides of square ABCD to the length of the sides of square PQRS is 3:1. If the area of square ABCD is 9 square units, what is the length of side PS?

6. Seven cards each containing one of the following letters C, B, T, A, E, M and H are placed in a hat. Each letter is used only once. Stu will pull four cards out at random and without replacement. What is the probability that Stu pulls out M, A, T, H in this order? Express your answer as a common fraction.

7. If x and y are positive integers with $x + y < 40$, what is the largest possible product xy ?

8. points Consider the rectangular region with vertices at (5, 4), (-5, 4), (-5, -4) and (5, -4). How many points with integer coordinates will be strictly in the interior of this rectangular region?

9. feet



A ball is dropped straight down from a height of 16 feet. If it bounces back each time to a height one-half the height from which it last fell, how far will the ball have traveled when it hits the floor for the sixth time?

10. degrees What is the degree measure of an interior angle of a regular pentagon?