8th grade Math Team Summer Packet

Before starting 8th grade math team you should be able to:

◆ Simplify integer expressions
◆ Solve multi-step equations and inequalities
◆ Apply the Pythagorean Theorem and know the common Pythagorean Triples
◆ Write square roots in simplest radical form
◆ Find the area of 2-D figures
◆ Find surface area and volume of 3-D geometric shapes
◆ Graph linear equations from slope-intercept form and standard form
◆ Write the equation of a line in slope-intercept form, given a graph
◆ Graph the a line, given the equation in slope-intercept form
◆ Solve a system of linear equations by graphing, substitution, and elimination
◆ Convert from fractions to decimals to percents
◆ Convert repeating decimals to fractions
◆ Convert from base 10 to other bases and vice versa
◆ Attempt to work all the problems on the tournament tests in this packet
◆ memorize factorials up to 10 (timed quiz 1st week)
◆ memorize all square roots up to 20 and cube roots up to 10 (timed quiz 1st week)
◆ memorize common fraction – decimal – percent equivalents (timed quiz 1st week)
◆ Chapters 1-3 Pre-Test (will be collected the first day- write final answers on test paper, but attach work that has been shown on separate paper. Failure to follow directions will result in a 0.)

Your assignment is to review all of the material in this packet over the summer and to complete all of the problems. These are concepts you should have learned in 7th grade math team class, so I will not be taking anytime in class to review these concepts. This entire packet will not be taken up for a grade, but you will be expected to know the material well that the worksheets cover. The final worksheet in the packet is a Pre-Test for Chapters 1-3 in the Algebra book. You will be turning that in the first day of school and I will use this to determine what concepts covered in those chapters that I will need to teach. The Pre-Test will be collected for a grade before you take the test, once you have a chance to correct any mistakes. You will then take the actual Chapters 1-3 Test that will count for a test grade.

All of the worksheets in this packet should be completed WITHOUT the aid of a calculator.
Be sure to bring the completed Ch 1-3 Pre-Test to school the first day.

I look forward to meeting you in August.   Ms, Shurer

Math Team Grade 8 - Things to Know

Be prepared to take a quiz on this material the **First Week** of school

Write each as a percent, decimal, and fraction.

$\frac{1}{2}$ =.5=50% $\frac{1}{3}$ =.3$\overline{3}$ =33$\frac{1}{3}$ % $\frac{2}{3}$ =.6$\overline{6}$ =66$\frac{2}{3}$ % $\frac{1}{4}$ =.25=25% $\frac{3}{4}$ =.75=75%

$\frac{1}{5}$ =.2=20% $\frac{2}{5}$ =.4=40% $\frac{3}{5}$ =.6=60% $\frac{4}{5}$ =.8=80%

$\frac{1}{6}$ =.1$\overline{6}$ =16$\frac{2}{3}$ % $\frac{5}{6}$ =.8$\overline{3}$ =83$\frac{1}{3}$ %

$\frac{1}{8}$ =.125=12$\frac{1}{2}$ % $\frac{3}{8}$ =.375=37$\frac{1}{2}$ % $\frac{5}{8}$ =.625=62$\frac{1}{2}$ % $\frac{7}{8}$ =.875=87$\frac{1}{2}$ %

$\frac{1}{9}$ =.1$\overline{1}$ =11$\frac{1}{9}$ % $\frac{2}{9}$ =.2$\overline{2}$ =22$\frac{2}{9}$ % $\frac{4}{9}$ =.4$\overline{4}$ =44$\frac{4}{9}$ %   **etc.**

$\frac{1}{12}$ =.08$\overline{3}$ 8$\frac{1}{3}$ % $\frac{5}{12}$ =.41$\overline{6}$ =41$\frac{2}{3}$ % $\frac{7}{12}$ =.58$\overline{3}$ =58$\frac{1}{3}$ % $\frac{11}{12}$ =.91$\overline{6}$ =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	
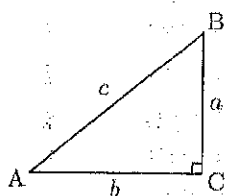
Polygons	# of sides	# of angles	# of vertices	# of diagonals
triangle	3	3	3	0
quadrilateral	4	4	4	2
pentagon	5	5	5	5
hexagon	6	6	6	9
heptagon	7	7	7	14
octagon	8	8	8	20
nonagon	9	9	9	27
decagon	10	10	10	35
dodecagon	12	12	12	54
icosagon	20	20	20	170

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

$\sqrt{4} = 2$ $\sqrt{9} = 3$ $\sqrt{16} = 4$ $\sqrt{25} = 5$ $\sqrt{36} = 6$ $\sqrt{49} = 7$ $\sqrt{64} = 8$ $\sqrt{81} = 9$

$\sqrt{100} = 10$ $\sqrt{121} = 11$ $\sqrt{144} = 12$ $\sqrt{169} = 13$ $\sqrt{196} = 14$ $\sqrt{225} = 15$ $\sqrt{256} = 16$

$\sqrt{289} = 17$ $\sqrt{324} = 18$ $\sqrt{361} = 19$ $\sqrt{400} = 20$ $\sqrt[3]{1} = 1$ $\sqrt[3]{8} = 2$ $\sqrt[3]{27} = 3$ $\sqrt[3]{64} = 4$

$\sqrt[3]{125} = 5$ $\sqrt[3]{216} = 6$ $\sqrt[3]{343} = 7$ $\sqrt[3]{512} = 8$ $\sqrt[3]{729} = 9$ $\sqrt[3]{1000} = 10$

Formulas

Circle: circumference = $2\pi r$ or πd area = πr^2 π = 3.14 or 22/7

Triangle: area = $\frac{1}{2} bh$ perimeter $a + b + c$
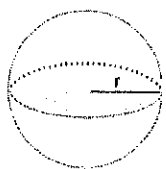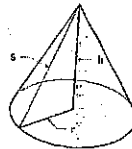
Square: area = s^2 perimeter $4s$
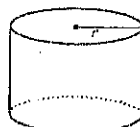
Rectangle: area = lw perimeter = $2l + 2w$

Trapezoid: area = $\frac{1}{2} h(b_1 + b_2)$

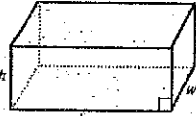Parallelogram: area = bh

Cube   Volume = s^3 Sphere   Volume = $\frac{4}{3}\pi r^3$

       surface area = $6s^2$ Surface Area = $4\pi r^2$

Cone   Volume = $\frac{1}{3}\pi r^2 h$ Cylinder   Volume = $\pi r^2 h$

surface   area = $\pi rs + \pi r^2$ 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 150:
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! = 362,880   10! = 3,628,800   n! = 1x2x3x....xn
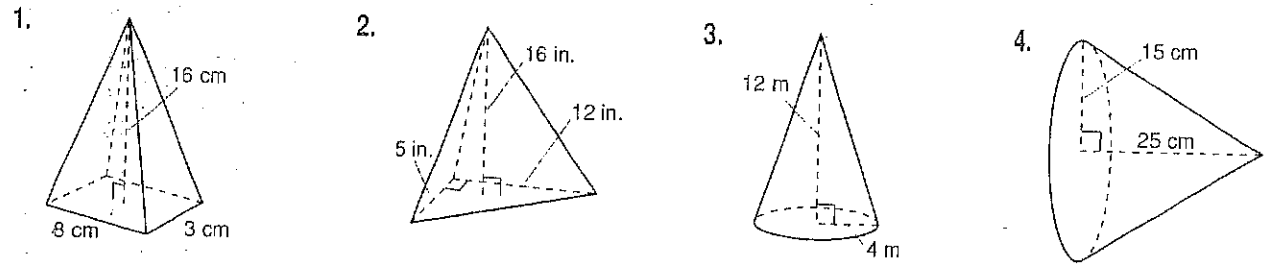
In Exercises 1–14, use 3.14 for π.

1. Find the volume of a cylinder with a radius of 2 meters and a height of 4 meters.

2. Find the volume of a cylinder with a base area of 625π in.^{2} and a height of 25 inches.

3. Find the volume of a cylinder with a diameter of 16 inches and a height of 4 inches.

4. Find the volume of a cylinder with a circumference of 25π and a height of 7.5 cm. (Hint: Use the circumference to find the radius.)
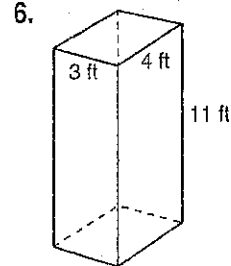
In Exercises 5–8, find the volume of the cylinder.

5.
3 mm
2 mm

6.
10 ft
8 ft

7.
3 in.
1 yd

8.
6 in.
10 in.
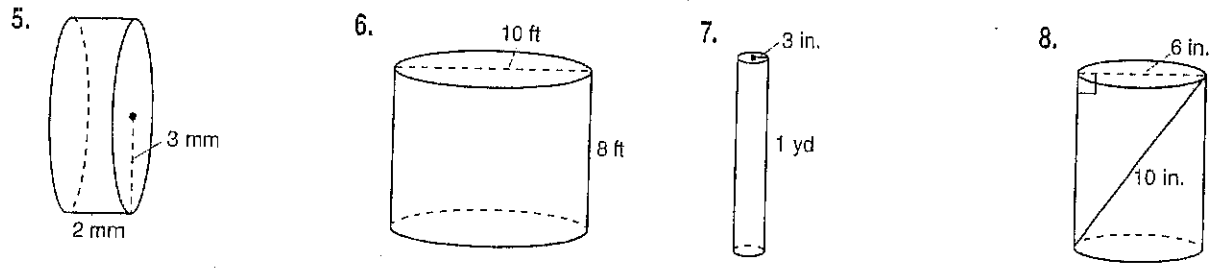
In Exercises 1–4, find the volume of the solid. Use 3.14 for π. Round your results to one decimal place.

1.
16 cm
8 cm   3 cm

2.
16 in.
12 in.
5 in.

3.
12 m
4 m

4.
15 cm
25 cm

In Exercises 7–9, find the volume of the solid. Use 3.14 for π. Round your result to one decimal place.

7.
8 cm
8 cm
8 cm
8 cm
8 cm

8.
20 cm
8 cm
20 cm
22 cm

9.
3 in.
3 in.
3 in.
5 in.
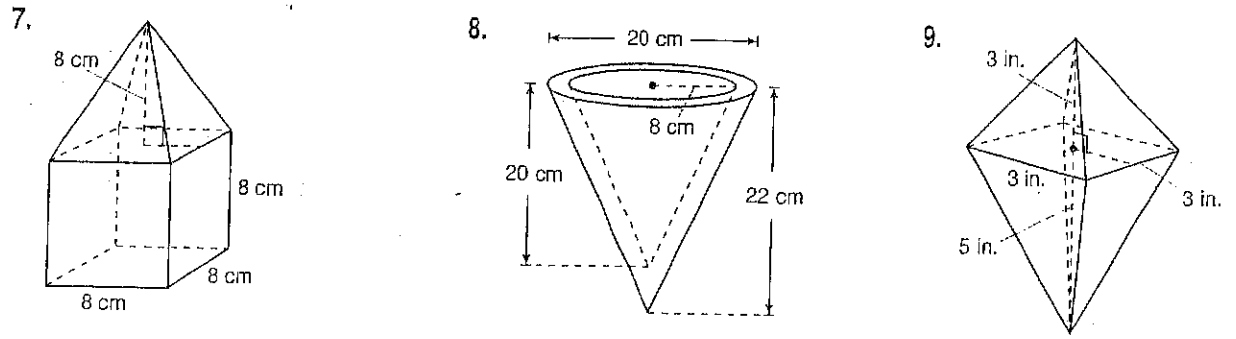
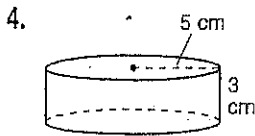In Exercises 1–6, find the surface area of the right prism or right cylinder.
Use 3.14 for π. Round your results to one decimal place.

1.

8 cm

12 cm

2.

2 in.

10 in.

2 in.

3.

$\sqrt{3}$ in.

2 in.   2 in.

5 in.

2 in.

4.

5 cm

3 cm

5.

3 m   4 m

12 m

6.

3 ft   4 ft

11 ft
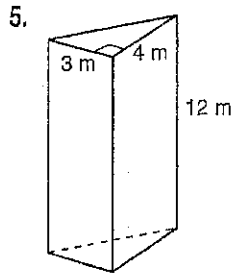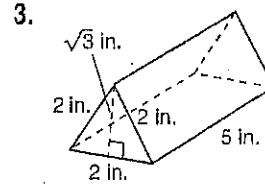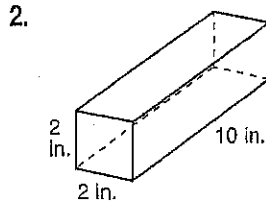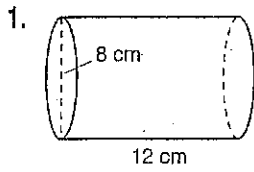
Repeating Decimals Worksheet

Directions: Convert each decimal to a fraction.

1. $0.\overline{6}$	2. $2.\overline{6}$	3. $0.\overline{54}$	4. $-6.\overline{2}$
5. $0.\overline{45}$	6. $1.\overline{6}$	7. $0.4\overline{6}$	8. $-7.\overline{6}$
9. $0.2\overline{6}$	10. $0.58\overline{3}$	11. $.\overline{235714}$	12. $0.\overline{90}$
13. $0.\overline{2}$	14. $0.\overline{7}$	15. $1.1\overline{6}$	16. $.\overline{8}$
17. $0.5\overline{3}$	18. $0.6\overline{1}$	19. $0.\overline{4}$	20. $0.\overline{3}$
21. $7.8\overline{3}$	22. $0.08\overline{3}$	23. $-2.0\overline{6}$	24. $0.\overline{72}$

Example:
$$10n = 1.6\overline{6}$$
$$-\quad n = .1\overline{6} \quad \text{one digit repeats (x both sides by 10)}$$
$$\frac{9n}{9} = \frac{1.5}{9} \quad \text{subtract}$$
$$n = \frac{1.5}{9} = \frac{15 \div 15}{90 \div 15} = \frac{1}{6}$$

This is why the method Mrs. Colley Showed you works

$$\text{so} \quad .1\overline{6} = \frac{1}{6}$$

Note: if 2 digits repeat, X by 100; 3- X by 1000, etc.
This step removes the repeating part of the decimal

Changing Bases Worksheet

Change each base 10 numeral to base 2.
1. 54   2. 384   3. 10   4. 516   5. 40

Change each base 10 numeral to base 4.
6. 38   7. 2049   8. 12   9. 564   10. 388

Change each base 10 numeral to base 5.
11. 488   12. 15   13. 5017   14. 283   15. 5000

Change each base 10 numeral to base 8.
16. 247   17. 317   18. 56   19. 27   20. 687

Example   change 31 to base 2

Mrs. Colley may have shown you
a different method to do these.
I don't care what method you use.

$$
\text{powers of 2}
$$

$$
\begin{array}{r|r|l}
16 & 31 & 1 \\
8 & 15 & 1 \\
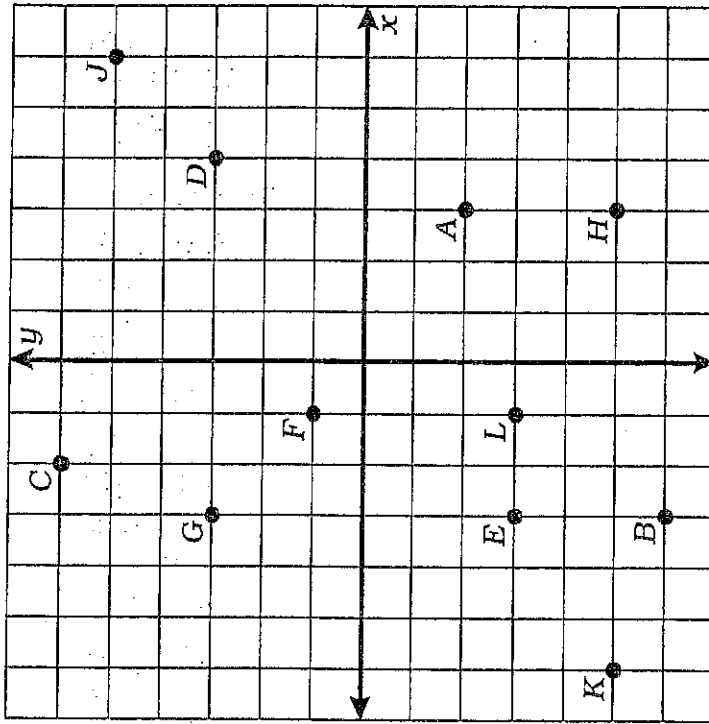4 & 7 & 1 \\
2 & 3 & 1 \\
  & 1 & 1
\end{array}
$$

$$31 = 11111_2$$

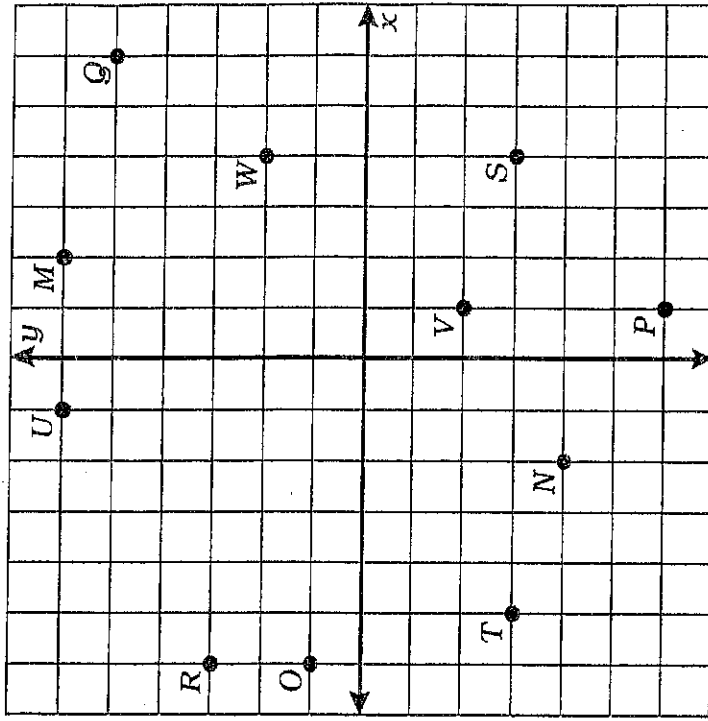# How Did the Light Dress Up For the Costume Party?

For each exercise, draw the line indicated and write its equation. Find your answer in the answer column and cross out the letter next to it. When you finish, the answer to the title question will remain.

1. Equation of $\overleftrightarrow{AB}$ _____

2. Equation of $\overleftrightarrow{CD}$ _____

3. Equation of $\overleftrightarrow{EF}$ _____

4. Equation of $\overleftrightarrow{GH}$ _____

5. Equation of $\overleftrightarrow{JK}$ _____

6. Equation of $\overleftrightarrow{GL}$ _____

7. Equation of $\overleftrightarrow{MN}$ _____

8. Equation of $\overleftrightarrow{OP}$ _____

9. Equation of $\overleftrightarrow{QR}$ _____

10. Equation of $\overleftrightarrow{ST}$ _____

11. Equation of $\overleftrightarrow{UV}$ _____

12. Equation of $\overleftrightarrow{SW}$ _____

Answers 1-6

R	$y = 2x - 6$
N	$y = \frac{2}{3}x - 4$
E	$y = -\frac{4}{3}x - 4$
P	$y = \frac{5}{6}x$
O	$y = 2x + 3$
H	$y = -\frac{1}{2}x + 3$
T	$y = -3x + 5$
N	$y = -\frac{4}{3}x - 1$
A	$y = \frac{2}{3}x - 1$
F	$y = -3x - 6$
R	$y = -\frac{1}{2}x + 5$

Answers 7-12

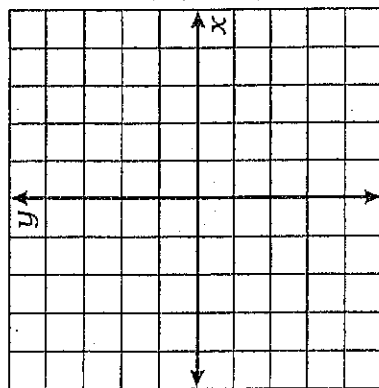|	
G	$y = -x - 5$
E	$y = -4$
R	$y = \frac{5}{2}x + 1$
O	$y = -4x + 2$
F	$x = 3$
A	$y = -4x - 5$
T	$y = -3$
S	$y = \frac{5}{2}x + 4$
N	$x = 4$
A	$y = -x + 2$
M	$y = \frac{1}{6}x + 4$

What Did the Teacher Do With Ogar's Cheese Report?

Solve each system of equations by graphing. Cross out the letters above each correct answer. When you finish, the remaining letters will tell you the answer to the title question.
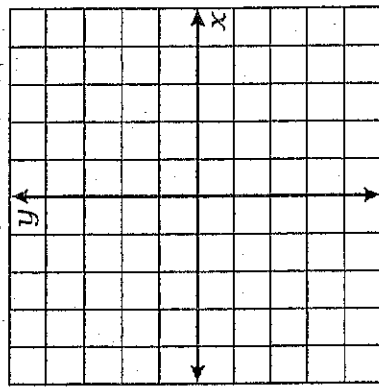
work for all (m =)
b =

1. $y = \frac{3}{2}x - 1$

$y = -x + 4$

2. $y = \frac{1}{3}x + 2$

$y = -\frac{4}{3}x - 3$

3. $y = 2x + 1$

$-2x + 3y = -9$
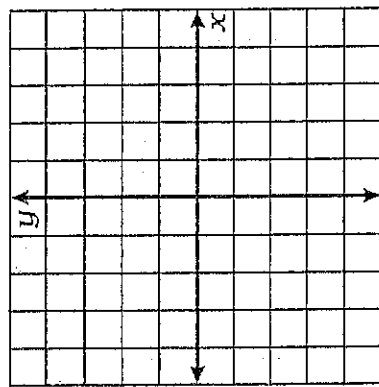
4. $3x + y = 0$

$x - y = 4$
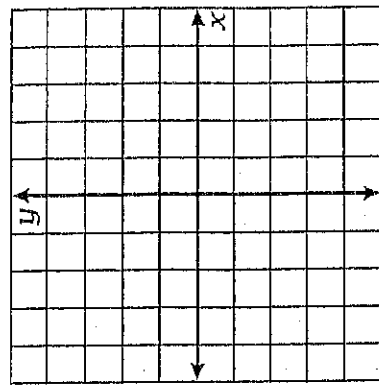
5. $-3x + 4y = 8$

$x + 2y + 6 = 0$
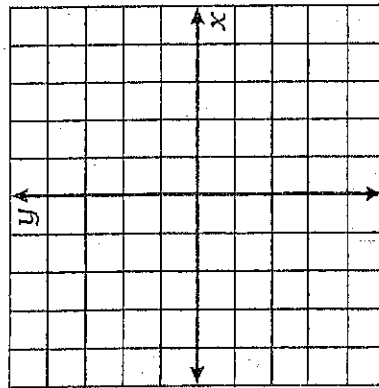
6. $7x - 5y = 20$

$-8x - 3y = 12$
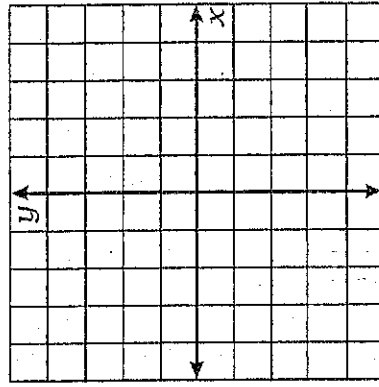
7. $-x - 4y = 12$

$20x + 80y = 0$
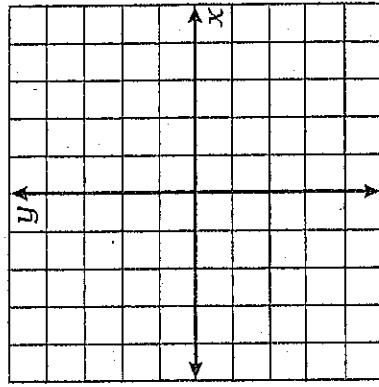
8. $30x + 50y - 100 = 0$

$3x - 15y - 30 = 0$
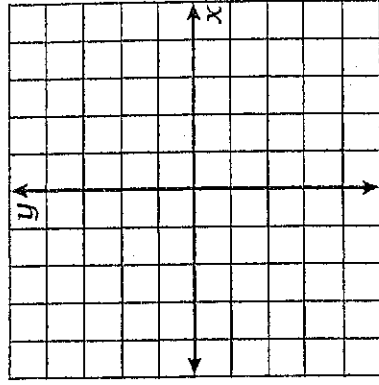
SH	HE	ES	TO	GR	AB	TH	AT	OP	SP	ED	QU	IT
(-3,1)	(4,3)	(-4,-1)	(5,-1)	(-2,4)	(-3,-5)	no solution	(-2,-3)	(2,2)	(0,-4)	(-4,0)	(1,-3)	(1,-1)

1. How many integers satisfy both 3-x≤ 2 and 2 (x-5) ≤ 2
    a. 7   b. infinitely many   c. 5   d.   6

2. What is 243 expressed as a binary number?
    a. 11110011   b. 101   c. 1011011 d. 11101110

3. What is the slope of the line passing through (2,3) and (-3,2) ?
    a. 5   b. 1   c. $\frac{1}{5}$ d. - 1

4. A recipe for <u>12 cupcakes</u> requires $1\frac{1}{2}$ cups of sugar. How many cups of sugar should
   be used if 20 cup cakes are being made with this same recipe?
    a. $2\frac{1}{2}$ b. $2\frac{1}{4}$ c. $2\frac{3}{4}$ d.   2

5. Find the greatest common factor 24 a^2b, $56a^3b^4$, and $72ab^3$
    a. $504a^3b^4$ b. $18ab$ c. $12ab^2$ d. $8ab$

6. Of the pieces of Jolly Ranchers candy found in Emmett's locker, 40% were grape,
    23.5% were strawberry, 12.5% were peach, 20% were apple, and the other 8 pieces
    were lemon. How many Jolly Ranchers were found in his locker?
    a. 95   b. 100   c. 200   d. 205

7. Lilli and Nora traveled 6 miles east and then 8 miles south in their boat. How far is the
    boat from its starting point?
    a. 48 miles   b. 10 miles   c. 14 miles   d. 2 miles

8. Solve for x. $\frac{5}{8}x = \frac{7}{6}$
    a. $-\frac{15}{28}$ b. $\frac{15}{28}$ c. $\frac{28}{15}$ d. $\frac{-28}{15}$

9. $\sqrt[3]{\sqrt{\sqrt{2}^{60}}}$
    a. 2^3 b. 2^5 c. 2^4 d. $2\square$

10. A rectangle with dimensions 225 by 196 has the same area as a square. What is the
    perimeter of the square?
    a. 210   b. 421   c. 116   d. 840

11. There are nine athletes competing in the track finals. In how many ways can the gold, silver, and bronze medal be awarded?

    a. 504   b. 27   c. 362,880   d. 3

12. Bill received a 20% raise each year for three consecutive years, What was his annual salary after three raises if his starting salary was $1000 per month?

    a. $20,736   b. $1,600   c. $17,280 d. $ 2,000

13. $x @ y = x^2 + 2xy + y^2$ and $x \# y = 3y + 4x$. Find $[4 @ (3 \# 4)]$
    a. 761   b. 841   c. 784   d. 836

14. If the average of n numbers is n, the their sum is:
    a. $\dfrac{n}{2}$ b. n^2 c. 2n   d. n

15. Julia owns 26% of an orchard. Bailey owns 66 acres, and Grace owns the rest. If Julia and Bailey together own 70% of the orchard, how many acres does Grace own?

    a. 40 acres   b. 50 acres   c. 55 acres d. 45 acres

16. 130 is 25% of what number?
    a. 520   b. 32.5   c. 105   d. 155

17. Which of the following has the largest value
    a. 2x[9-(6-3)] b. 2x[(9-6)-3]   c. [2x(9-6)]-3   d. (2x-9)-(6-3)

18. Find 35% of 14% of 92
    a. 4.58   b. .4508   c. 4.508   d. .04508

19. What is the quotient when 0.48 is divided by 0.016?
    a. 0.3   b. 3   c. 30   d. 300

20. If a stack of eight quarters measures exactly one inch, how many inches high would a $100 stack of quarters be?
    a. 50 inches   b. 12.5 inches   c. 38 inches   d. 96 inches

21. How many eighths are in 5.75 ?
    a. 23   b. 46   c. 120   d. 63

22. What is the average of $\frac{1}{4}$ and $\frac{1}{6}$?

    a. $\frac{5}{12}$ b. $\frac{1}{5}$ c. $\frac{1}{10}$ d. $\frac{5}{24}$

23. If the area of a square is 1024, what is the perimeter of the square?
    a. 128   b. 32   c. 256   d. 64

24. In a school of 910 students, the ratio of boys to girls is 5:2. How many more boys than girls are in the school?
    a. 650   b. 260   c. 390   d. 455

25. $(\frac{1}{3} - \frac{1}{4}) - (\frac{1}{6} - \frac{1}{12})$

    a. $\frac{1}{12}$ b. 0   c. $\frac{1}{6}$ d. 6

Tie Breakers

T1. $\frac{1}{10} + \frac{1}{5} + \frac{1}{10} + \frac{1}{5} + \frac{1}{10} + \frac{1}{5} + \frac{1}{10} + \frac{1}{5} =$

T2. (10% of 20) minus (20% of 10)

T3. Sally drove 238 miles in 4 hours and 15 minutes. What was her average speed in miles per hour?

1. If $r > 1$ which one of the following must also be true ?

a) $r + 1 = 2$ b) $r - 1 = 0$ c) $r + 1 > 2$ d) $r = 2$ e)NOTA

2. Evaluate the following: $44 - 33 \div 11 - 1 \times 2$

a) 27   b) 2   c) 40   d) 39   e)NOTA

3. If $a = b$ and $b = 2c$, find $a + b + c$ when $c = 6$

a) 18   b) 24   c) 30   d) 36   e)NOTA

4. Solve: $2 (2x - 2 (2 + 2)) = 8x$

a) 4   b) 2   c) -2   d) 8   e)NOTA

5. A circle with center at the origin passes through the point $(3 , 4)$. What is the diameter of the circle?

a) 7 units   b) 10 units   c) 5 units   d) 12 units   e)NOTA
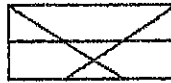
6. Which quadrant does the graph of $y = -3x - 3$ NOT   pass through?

a) I   b) II   c) III   d) IV   e)NOTA

7. The following equation has two answers. What is the sum of the answers? $(a + 2) (a - 2) = 21$

a) 4   b) 10   c) 7   d) 0   e)NOTA

8. Find the total number of triangles in the drawing.

a) 7   b) 9   c) 4   d) 8   e)NOTA

9. A code to enter a building has a single letter followed by three digits. How many different codes are possible?

a) 36   b) 326   c) 3026   d) 26000   e) NOTA

10. Find the surface area of a cube that has a volume of $\dfrac{8}{27}$ cm^3 .

a) $\dfrac{8}{3}$ cm^2 b) 6 cm^2 c) $\dfrac{1}{3}$ cm^2 d) $\dfrac{8}{27}$ cm^2 e)NOTA

12. How many integer solutions does the equation have? $|2x - 4| < 2$

a) 6   b) 3   c) 2   d) 1   e)NOTA

13. A boy and a girl want to have a secret meeting. They are 3000 feet apart and walk toward each other at the same time. The boy walks twice as fast as the girl does. If the boy walks 100 feet per minute, how long does it take them to meet?

a) 30 minutes   b) 20 minutes   c) 40 minutes   d) 10 minutes   e)NOTA

14. Two squares are placed as shown Find the area of the shaded region.

12cm   9 cm
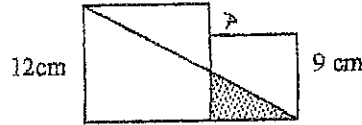
a) $\dfrac{81}{4}$ cm^2 b) 26 cm^2 c) $\dfrac{162}{7}$ cm^2 d) $\dfrac{27}{2}$ cm^2 e)NOTA

15. Consider the linear equation $y = mx + 12$ and statements I and II: Which answer choice is true?

I. The line is parallel to the x axis.
II. The line has a slope of m

a) Sometimes I
    Sometimes II
     b) Sometimes I
       Always II
     c) Always I
       Sometimes II
     d) Always I
       Always II
     e)NOTA
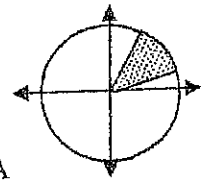
16. Which one of the following numbers is the mean of the other three numbers? 10, 6, 8, 16

a) 6   b) 8   c) 10   d) 16   e)NOTA

17. The line $y = 1$ is reflected over the line $x = 1$. The equation of the resulting line is:

a) $x + y = 2$ b) $y = 1$ c) $y = -1$ d) $x - y = 1$ e)NOTA

18. A segment connecting the origin to the point $(12, 5)$ is rotated 30^0 counter clockwise to create the shaded shape. Find the area of the shaded region.

a) $\dfrac{169}{12}\pi$ units^2 b) $\dfrac{169}{30}\pi$ units^2 c) 169π units^2 d) 30π units^2 e) NOTA

19. Paul looks back at his life and sees that he spent 1/6 of his life as a child, 1/8 of his life as a youth, 1/2 of his life as a man and the remaining 15 years as an old man. How old is Paul?

a) 24   b) 96   c) 74   d) 72   e)NOTA

20. The edges of a of a rectangular prism are in a ratio of $2 : 3 : 5$ and the shortest edge has a length of x. Find the ratio of the volume of the prism to it's surface area.

a) $3x : 1$ b) $15x : 62$ c) $10x : 3$ d) $15x : 31$ e)NOTA

21. If Ms. Campbell can grade x papers in y hours. How many hours will it take to grade z papers?

a) $\dfrac{xy}{z}$ hours   b) xyz hours   c) $\dfrac{xz}{y}$ hours   d) $\dfrac{yz}{x}$ hours   e)NOTA

23. Soup and salad cost $12. Salad and a sandwich cost $13. Soup and a sandwich cost $11. What would the total cost be if you bought three soups and three salads and three sandwiches?

a) $54   b) $108   c) $36   d) $18   e)NOTA

24. Which of the quadrants of the coordinate plane does not contain an answer to the function: $f(x) = \dfrac{2}{x-3} - 4$

a) I   b) II   c) III   d) IV   e)NOTA

25. The Braille alphabet uses a series of six dots that are either raised or recessed to form each symbol.

Six dots are always used and form a rectangle as shown.   Using this information, how many different symbols

can be formed?

a) 12   b) 24   c) 48   d) 64   e)NOTA

TB1   Find the sum of the first 300 positive integers.
TB2   The 4th root of a number is ½ . Find the number.
TB3   Find the sum of the unique, positive, integer factors of 81.

Chapters 1 – 3

Show all work neatly and numbered on your own sheet of paper. Write final answers in the blanks provided.

Simplify.

1. $\dfrac{30 \div 5 - 2}{2(5-3)}$

2. $\dfrac{-30}{-\dfrac{1}{2}}$

3. $56 \div 8 - 6 \div 2$

4. $.9 - 1.02 + .54$

5. $-7(-5r - 1) + 2(4 - 3r)$

6. $|3 - 1| - |1 - 3|$

Evaluate each expression if $r = -2$, $s = |-3|$, $t = \dfrac{1}{3}$, **and** $v = 6$.

7. $-4r(t + v)$

8. $\dfrac{st + 4v}{r - 3}$

Solve each equation. If it is an identity or has no solution, say so.

9. $|a| = 8$

10. $|b| = -6$

11. $15 - (5 - n) = 1$

12. $100 - d = 0$

13. $-12j = -84$

14. $4 + \dfrac{5}{2}(g - 3) = 24$

15. $-5(2h - 1) - 8 = 7$

16. $\dfrac{2}{5}x + 16 = 0$

17. $-2(3 - b) = 2b + 6$

18. $3\left(2m - \dfrac{1}{3}\right) = 2\left(3m - \dfrac{1}{2}\right)$

19. $\dfrac{5}{6}(7x-15) = 4x+4$

19. _____ *(4)*

⭐ **Solve each equation. You <u>MUST define each unknown quantity, write an equation</u> and solve it. Doing them in a chart is encouraged, but optional. Write <u>the final answer(s) only</u> on the blank provided and include the correct units of measure (label).**

20. Six times a number, decreased by five, is −14. Find the number.

20. _____ *(5)*

21. The longest side of a triangle is 8 cm longer than the shortest side and 5 cm longer than the third side. If the perimeter is 56 cm, find the lengths of all 3 sides.

21. _____ *(6)*

_____

_____

22. The numbers of fish in Rick and Lisa's aquarium are consecutive integers. When they each had three less fish, together they had 15 fish. How many fish does each have now if Lisa has more fish?

22. _____ *(5)*

_____

23. When Kate worked 10 h overtime she earned $8 more than one third the amount she earns for 40 h of work at her usual rate. If her overtime rate is $2.40 more per hour that her usual rate, find her overtime rate (the amount of money she makes for each overtime hour).

23. _____ *(5)*

24. Twin Cinema I seats 150 more people that Twin Cinema II. If the cinemas seat 1250 people altogether, find the number of seats in Cinema II.

24. _____ *(5)*

25. Zach's last test score was 30 points less than twice his first score. What was his first score if the sum of the two scores is 150?

25. _____ *(5)*

BONUS QUESTION *(5pts extra)*

On the first of three tests, Katie scored 72 points. On the third test, her score was 1 point more than on the second test. Her average on the three tests was 83. What were her scores on the second and third tests?

_____ *(5)*