



Exam Sheet  
Grade-6 GSW  
Junior  
Mathematics  
Tournament

March 3

2012

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Grade -6

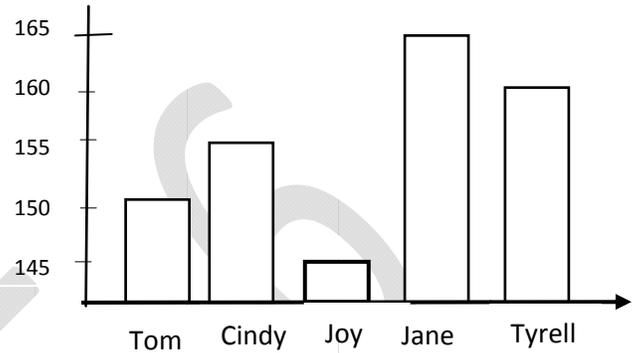
**DO NOT OPEN UNTIL YOU ARE INSTRUCTED TO DO SO**

1. What is 25% of 56?
2. What percent of 64 is 48?
3. 13 is 25% of what number?
4. If there are 3 cars for every 8 students at a high school, how many cars are there for 200 students?

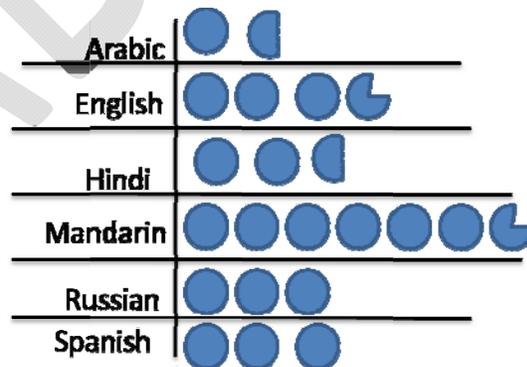
5. 1 tablespoon =  $\frac{1}{16}$  cup. How many tablespoons are in 2.75 cups?

6. Sam wants to drive from City A to City B. He measures the distance on the map as  $2\frac{1}{4}$  inches. In reality, the distance between the cities is  $20\frac{1}{4}$  miles. The scale factor that the map uses is 1 inch equals how many miles?

7. The graph shown gives the height in centimeters of five students. What is the difference in height in centimeters between Cindy and the tallest student?



8. The following pictograph shows the approximate number of people who speak the six most common languages on earth.



Each  represents 100 million people. According to the pictograph, how many more people speak Mandarin than English?

9. What is the greatest common factor (GCF) of 60 and 24?

10. What is the prime factorization of the value of  $5^2 - 3^2$ ?

11. Tony and Melissa want to buy 3 CDs priced at \$20.00 each. The store is offering a deal of buy two at full price, and the third is 40% off. How much do they have to pay to buy three CDs?

12. Consider the fractions:  $\frac{3}{4}, \frac{4}{6}, \frac{5}{8}$

What is the sum of the two smaller of these fractions?  
Express your answer as a mixed number.

13. What is the value of  $x$ , if  $2+3x = 26$ ?

14. Divide:  $12.02 \div 0.05$

15. The ratio of the diameter of a large pizza to the diameter of a medium pizza is 3:2. If the diameter of a large pizza is 15 inches, what is the diameter of a medium pizza in inches?

16. Express as a mixed number:

$$\frac{-1.5 + (-1)^2 - (-6 + 4)}{1.4 - 1}$$

17. Brittany took a 60-question test. The table below shows her results.

	Multiple Choice Questions	True/False Questions
Number of Questions Answered Correctly	32	13
Number of Questions Answered Incorrectly	8	7

What percent of questions did Brittany answer correctly?

18. Davis earns \$40.00 one week from delivering newspapers. He places  $\frac{1}{5}$  of the amount into a savings account and plans to spend the rest. He buys a DVD for \$19.95. How much spending money does Davis have left?

19. A rectangular window has dimensions 2.5 feet by 3.75 feet. What is the perimeter of the window in inches?

20. Tanisha has a jar that contains 4 red marbles, 8 green marbles, 3 orange marbles and 9 blue marbles. If she pulls out one of the marbles without looking, what is the probability that the marble is NOT green? Express your answer as a simplified fraction.

21. What is the eighth term in the sequence:  
20, 27, 22, 29, 24,....?

22. The number of vertices of a cube plus the number of faces of a rectangular pyramid plus the number of edges of a triangular prism is equal to what number?

23. If a cube has a surface area of 294 square cm, what is its side length in cm?

24. Susan is  $40\frac{4}{9}$  inches tall. Her sister Zoe is  $33\frac{1}{3}$  inches tall. How much taller than her sister is Susan? Express your answer as a mixed number.

25. What would the figure  look like if it were rotated by  $216^\circ$  clockwise about the center point?

- A.  B. 
- C.  D. 

26. Carl's bicycle tires have a diameter of 36 inches. How many inches will the bike travel in exactly one full turn of the tires? (use  $\pi = 3.14$ )

27. Suppose that you triple a number and add 3, and then triple that result to obtain 81. What was the number you started with?

28. A juice container holds 450 ml of juice. If a box holds 20 juice containers, how many liters of juice does the box hold?
29. When rounding to the nearest whole number, which of the following rounds to 23?
- A)  $23\frac{2}{3}$       B)  $23\frac{5}{8}$
- C)  $22\frac{21}{23}$       D)  $22\frac{5}{12}$
30. A large pizza has a diameter of 16 inches while a small pizza has a diameter of 8 inches. The area of a large pizza is how many times the area of a small pizza?
31. Elizabeth has 16 apples and 12 oranges. She uses all the apples and the oranges to make fruit baskets for a retirement home. Each fruit basket has the same number of apples and the same number of oranges. What is the largest number of fruit baskets she can make?



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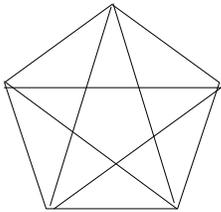
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3. A regular pentagon has 5 diagonals. How many diagonals does a regular hexagon have?



4. The table below relates values for  $x$  and values of  $y$ . What  $y$ -value is related to an  $x$ -value of 4?

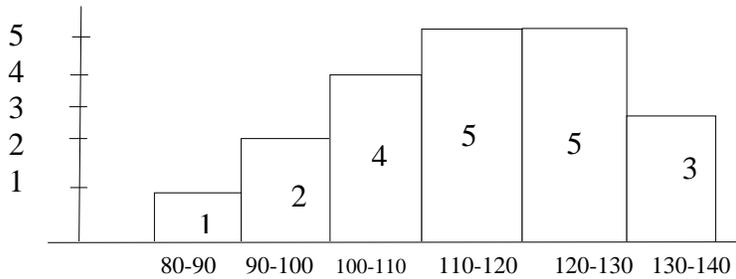
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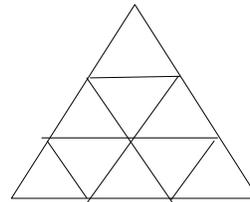
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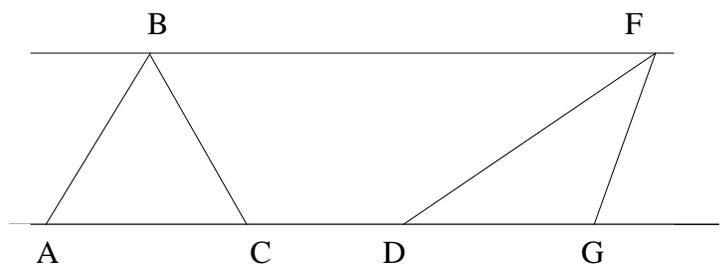
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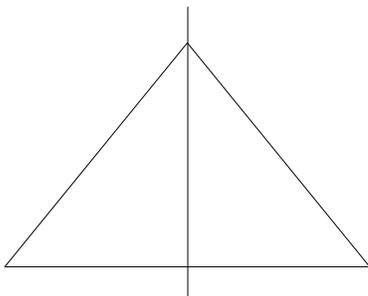
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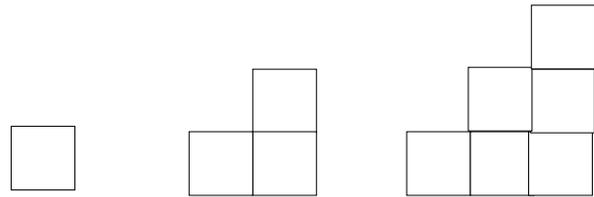
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22. Suppose a car traveling 40 mph completed a trip in 3 hours. How fast should a car travel to complete the trip in 2 hours?

23. Which 3-dimensional shape will be generated if an equilateral triangle is rotated about the line that contains an altitude?



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26.  $12,345,679 \times 7 \times 9 = ?$

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30. What is one-half of one-third of one-fifth of one-sixth of the number of degrees in a circle?

31.  $(10^2 + 11^2 + 12^2 + 13^2 + 14^2) \div 365 = ?$

32. Write the correct number in the box.

$$1^1 + 2^2 + 3^3 + 4^4 = \boxed{\phantom{000}}$$

33. A ten-inch circular pizza has a central circular region of diameter eight inches that is covered with topping. So there is a one-inch wide crust border. What percentage of the pizza is actually covered with topping?

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35.  $(1)(6589) + (2)(6589) + (3)(6589) + (4)(6589) = ?$

36. What is the 10th entry in this sequence:  
1, 1, 2, 3, 5, 8, \_\_, \_\_, \_\_, \_\_, ...?

37. On a mariner's compass  $0^\circ$  is due north and  $90^\circ$  is due east. How many degrees would correspond to east-north-east (ENE)?

38. Planet Earth is calibrated around the Equator by 360 degrees of longitude and 24 time zones of one hour length each. What is the average number of degrees longitude for a one-hour time zone?

39. On March 9, 1999 the date was composed of all odd digits: 3/9/1999. What is the next date in our future when this odd happening will occur again after 11/19/1999?

40. What is the least common multiple of 3, 4, 5, and 6?

41. What is the greatest common divisor of 100, 144, and 132?



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Grade -8

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1.  $7^3 + 2^4 = ?$
2. Order the following from smallest to largest:  $\frac{4}{7}, \frac{5}{8}, \frac{6}{11}$ .
3. Through which quadrants of the Cartesian coordinate plane does the graph of  $y = -2x - 1$  lie?
4. What is the sum of 84% of 28 and 46% of 38?
5. Simplify:  
$$\frac{\frac{3}{4} + \frac{5}{6}}{\frac{3}{8} - \frac{1}{6}}$$
6. Find  $4x - 3y$ , if  
 $2x - 3y = -8$   
 $3x + 4y = 5$
7. If you roll a pair of six-faced dice, what is the probability that you will have a sum of four?
8. You flip a coin three times. What is the probability that you get exactly one head?
9. Simplify:  $(2x - 3y) - (-4x + 4y)$
10. (3,2) and (6,20) are points on a line. What is the value of  $y$  if the point (8, $y$ ) is on this line?
11. The degree measures of the angles of a triangle are  $x$ ,  $2x - 20$ , and  $3x - 40$ . What is the degree measure of the largest angle of the triangle?
12. The degree measures of the angles of a quadrilateral are  $x - 10$ ,  $x + 5$ ,  $x + 10$ , and  $2x - 15$ . What is the degree measure of the largest angle of the quadrilateral?
13. What is the product of 2,000,000,000 and 6,000,000 when expressed in scientific notation form?
14.  $(3\sqrt{2} + 4\sqrt{3})(3\sqrt{2} - 4\sqrt{3}) = ?$
15. Solve for  $x$ :  
 $2^{(3x-8)} \cdot 8^x = 4^x$ .
16. What must  $x$  be in the following data for the mean of the data to be 6?  
 $\{1, 1, 2, 2, 2, 3, 4, 5, 7, 9, x\}$

17. How much larger is the range of the following data than the data's median?  
 $\{1, 3, 5, 9, 11, 17, 18, 20, 21, 22\}$
18. How many distinct prime factors does 840 have?
19. Answer this question about 1,536.2479. What is the quotient when the sum of its hundreds digit and its thousandths digit is divided by the difference of its units digit and its hundredths digit?
20. Solve for x:  $\frac{x+2}{3} - \frac{x}{2} = \frac{4x-2}{6}$
21. Solve for x:  
 $3(2 - 4x) - 5(5 - 2x) = 4(3x - 2)$ .
22. What is the sum of the solutions of the following equation?  
 $|2x - 3| = 7$
23. Which one of the following is the dimensions of a right triangle?  
 A) 2, 3, 4                      C) 5, 12, 13  
 B) 4, 5, 6                      D) 6, 10, 14
24. What is the height of a trapezoid whose bases have lengths 4 and 8 and whose area is 48?
25. In the mathematical expression  $x + y \times z - k$ , each variable is to be replaced by one of the numbers: 1, 2, 3, and 4. Each number can be used only once. What is x for the expression to be the largest possible?
26. A trip to Shipwreck Island cost \$22 for adults and \$12 for children. Six adults make the trip. If the cost for the 6 adults and all of the children is \$288, how many children went?
27.  $(15 \text{ lbs } 9 \text{ oz} - 6 \text{ lbs } 10 \text{ oz}) = ?$   
 Answer in lbs and oz
28. What is the area of the quadrilateral in square units whose vertices are  $(-1,2)$ ,  $(3,2)$ ,  $(-1,-1)$ , and  $(3,-1)$ ?
29.  $(x - 2)(x^2 + 2x + 4) = ?$
30.  $\frac{x^3 - 7x - 6}{x + 2} = ?$
31. Steve travels 182 miles in 195 minutes. What was his average speed in miles per hour?

32. The length of one of the legs of a right triangle is twice the length of the other leg. What is the length of the longest leg if the hypotenuse is  $4\sqrt{5}$ ?

33. What is  $\frac{2x^2 + 3z^2 - xy - x}{x - y + z - 2}$  when  $x = -1$ ,  $y = 2$ , and  $z = -3$ ?

34. The perimeter of an isosceles triangle is 12. If the length of one side of the triangle is 2, what is the length of either of the other two sides?

35. What is the sum of the next three terms in the arithmetic sequence whose first four terms are 3, 7, 11, 15?

36. During a tax-free holiday you buy 4 notebooks that cost \$1.50 each, 4 pens that cost a total of \$3, and 3 erasers that cost \$1.25 each. If you give the cashier a twenty-dollar bill, how much change should you receive?

37. Which one of the following is irrational?

A) 0.21                      D)  $\frac{3}{19} + \frac{5}{61}$

B)  $\frac{\sqrt{12}}{\sqrt{3}}$                       E)  $\frac{\sqrt{32}}{\sqrt{16}}$

C)  $\sqrt{6} \cdot \sqrt{54}$                       F)  $(\sqrt{7})^2$

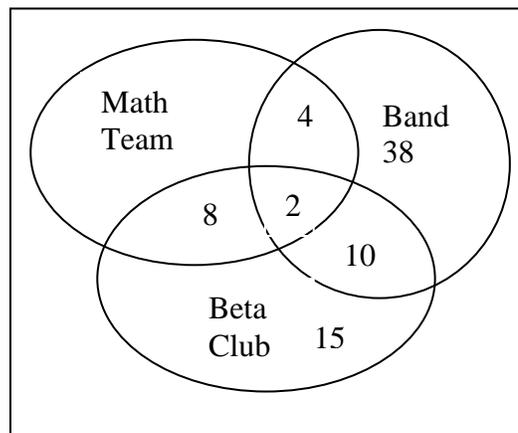
38. Solve for x:  
 $2(3-5x) - 3(2x-1) < -15x + 7$ .

39. Solve for x:  $\frac{2x-3}{2} - \frac{x}{4} \leq \frac{5-x}{3}$ .

40. 84% of what number is 189?

41. 
$$1 - \frac{\frac{1}{2}}{1 - \frac{3}{1 - \frac{1}{2}}} = ?$$

42. The Venn diagram shows the number of students on the mathematics team, in the band, and in the Beta Club at Candler Middle School. How many more students at Candler Middle School are in both the Beta Club and Band than are in both the Beta Club and on the Mathematics Team?





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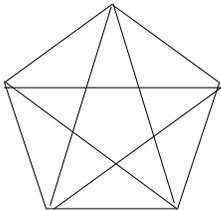
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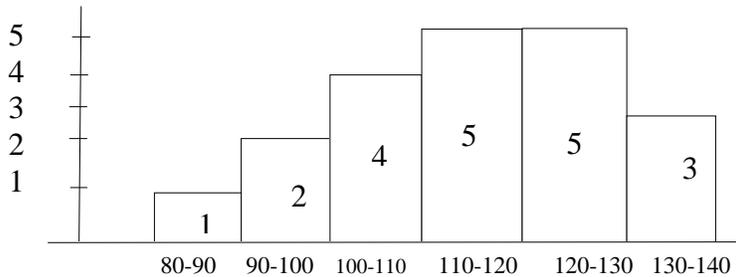
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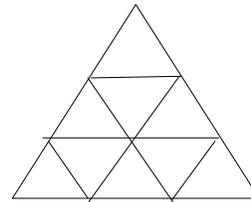
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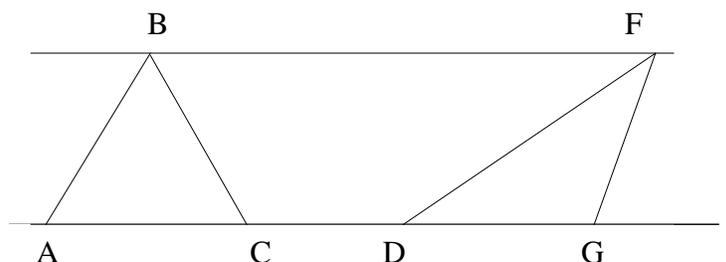
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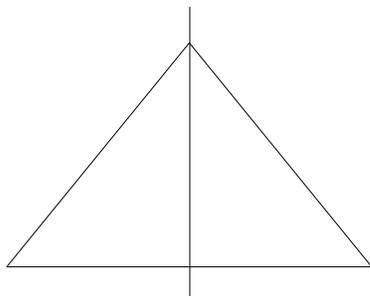
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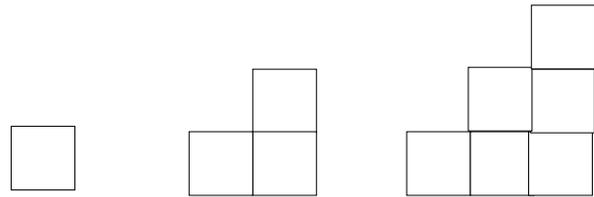
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3. Through which quadrants of the Cartesian coordinate plane does the graph of  $y = -2x - 1$  lie?
4. What is the sum of 84% of 28 and 46% of 38?
5. Simplify:  

$$\frac{\frac{3}{4} + \frac{5}{6}}{\frac{3}{8} - \frac{1}{6}}$$
6. Find  $4x - 3y$ , if  
 $2x - 3y = -8$   
 $3x + 4y = 5$
7. If you roll a pair of six-faced dice, what is the probability that you will have a sum of four?
8. You flip a coin three times. What is the probability that you get exactly one head?
9. Simplify:  $(2x - 3y) - (-4x + 4y)$
10. (3,2) and (6,20) are points on a line. What is the value of  $y$  if the point (8, $y$ ) is on this line?
11. The degree measures of the angles of a triangle are  $x$ ,  $2x - 20$ , and  $3x - 40$ . What is the degree measure of the largest angle of the triangle?
12. The degree measures of the angles of a quadrilateral are  $x - 10$ ,  $x + 5$ ,  $x + 10$ , and  $2x - 15$ . What is the degree measure of the largest angle of the quadrilateral?
13. What is the product of 2,000,000,000 and 6,000,000 when expressed in scientific notation form?
14.  $(3\sqrt{2} + 4\sqrt{3})(3\sqrt{2} - 4\sqrt{3}) = ?$
15. Solve for  $x$ :  
 $2^{(3x-8)} \cdot 8^x = 4^x$
16. What must  $x$  be in the following data for the mean of the data to be 6?  
 $\{1, 1, 2, 2, 2, 3, 4, 5, 7, 9, x\}$

17. How much larger is the range of the following data than the data's median?  
 $\{1, 3, 5, 9, 11, 17, 18, 20, 21, 22\}$
18. How many distinct prime factors does 840 have?
19. Answer this question about 1,536.2479. What is the quotient when the sum of its hundreds digit and its thousandths digit is divided by the difference of its units digit and its hundredths digit?
20. Solve for x:  $\frac{x+2}{3} - \frac{x}{2} = \frac{4x-2}{6}$
21. Solve for x:  
 $3(2 - 4x) - 5(5 - 2x) = 4(3x - 2)$ .
22. What is the sum of the solutions of the following equation?  
 $|2x - 3| = 7$
23. Which one of the following is the dimensions of a right triangle?
- A) 2, 3, 4                      C) 5, 12, 13  
 B) 4, 5, 6                      D) 6, 10, 14
24. What is the height of a trapezoid whose bases have lengths 4 and 8 and whose area is 48?
25. In the mathematical expression  $x + y \times z - k$ , each variable is to be replaced by one of the numbers: 1, 2, 3, and 4. Each number can be used only once. What is x for the expression to be the largest possible?
26. A trip to Shipwreck Island cost \$22 for adults and \$12 for children. Six adults make the trip. If the cost for the 6 adults and all of the children is \$288, how many children went?
27.  $(15 \text{ lbs } 9 \text{ oz} - 6 \text{ lbs } 10 \text{ oz}) = ?$   
 Answer in lbs and oz
28. What is the area of the quadrilateral in square units whose vertices are  $(-1,2)$ ,  $(3,2)$ ,  $(-1,-1)$ , and  $(3,-1)$ ?
29.  $(x - 2)(x^2 + 2x + 4) = ?$
30.  $\frac{x^3 - 7x - 6}{x + 2} = ?$
31. Steve travels 182 miles in 195 minutes. What was his average speed in miles per hour?

32. The length of one of the legs of a right triangle is twice the length of the other leg. What is the length of the longest leg if the hypotenuse is  $4\sqrt{5}$ ?

33. What is  $\frac{2x^2 + 3z^2 - xy - x}{x - y + z - 2}$  when  $x = -1$ ,  $y = 2$ , and  $z = -3$ ?

34. The perimeter of an isosceles triangle is 12. If the length of one side of the triangle is 2, what is the length of either of the other two sides?

35. What is the sum of the next three terms in the arithmetic sequence whose first four terms are 3, 7, 11, 15?

36. During a tax-free holiday you buy 4 notebooks that cost \$1.50 each, 4 pens that cost a total of \$3, and 3 erasers that cost \$1.25 each. If you give the cashier a twenty-dollar bill, how much change should you receive?

37. Which one of the following is irrational?

A) 0.21                      D)  $\frac{3}{19} + \frac{5}{61}$

B)  $\frac{\sqrt{12}}{\sqrt{3}}$                       E)  $\frac{\sqrt{32}}{\sqrt{16}}$

C)  $\sqrt{6} \cdot \sqrt{54}$                       F)  $(\sqrt{7})^2$

38. Solve for x:  
 $2(3-5x) - 3(2x-1) < -15x + 7.$

39. Solve for x:  $\frac{2x-3}{2} - \frac{x}{4} \leq \frac{5-x}{3}.$

40. 84% of what number is 189?

41. 
$$\frac{1}{1 - \frac{2}{1 - \frac{3}{1 - \frac{1}{2}}}} = ?$$

42. The Venn diagram shows the number of students on the mathematics team, in the band, and in the Beta Club at Candler Middle School. How many more students at Candler Middle School are in both the Beta Club and Band than are in both the Beta Club and on the Mathematics Team?

