

Sixth Grade  
Math Mastery Assessment

1. \_\_\_\_\_ Which expression will give an answer less than 1?
- a)  $1.12 - 0.2$     c)  $6.2 \_ 0.2$   
b)  $2.7 \div 1.8$     d)  $0.596 + 0.525$
2.    A) Choose a COMPOSITE number between 51 and 100.
- B) List ALL the factors of the number you chose.
- C) From the composite number you chose in part A) Make a factor tree. List the prime factorization.
3. \_\_\_\_\_ Of the following numbers, if you factor each to prime factors, which has the most factors of 2?
- a) 16                    c) 444  
b) 88                    d) 2222
4. \_\_\_\_\_ Find the sum of the following:  $\frac{1}{4} + 0.94 + \frac{2}{5} + 1.78 =$
- a) 5.47                    c) 3.37  
b) 6.62                    d) None of the above
5. \_\_\_\_\_ Which step reflects the distributive property for the following problem?
- a)  $5(15) = 5(10 + 5)$   
b)  $5(10 + 5) = 5(10) + 5(5)$   
c)  $5(10) + 5(5) = 50 + 25$   
d)  $50 + 25 = 75$

6. John and Kara had an argument. John said  $2^4$  equals 8. Kara says it is 16. Who is correct? Explain.
7. There is a sale on canned food in the grocery store. 3 cans for 4.99 or 10 for 12.99. Which is the better buy? \_\_\_\_\_ Explain your reasoning.
8. Put the following numbers in order from the least to the greatest: 3, 0.75,  $\frac{2}{5}$ , 0.3,  $\frac{1}{3}$
9. \_\_\_\_\_ *Estimate* the following sum as a whole number (NOT THE EXACT SUM):  
 $\frac{9}{10} + \frac{11}{12} + 0.99 + 1.02 =$  \_\_\_\_\_ Explain your thinking.
10. A) Complete the Fraction Equivalency Chart.

<b>Fraction</b>	<b>Equivalent fraction in simplest form</b>
6/8	
2/10	
5/20	
20/25	

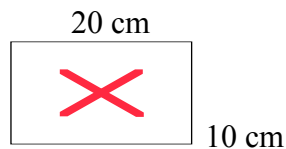
B) Explain your strategy for finding the simplest form of a fraction.

- C) Does the simplest form of a fraction represent a smaller number than the original fraction. For example, does  $\frac{1}{3}$  represent a smaller number than  $\frac{3}{9}$ ? \_\_\_\_\_  
Justify your answer using diagrams, real life examples, and numerical reasoning.

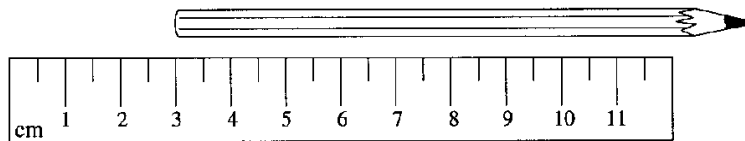
11. \_\_\_\_\_ Which of the following expressions does *not* describe the value of the digit 5 in the number 21.3572?

- a) 500 ten-thousandths      c) 50 tenths  
b) 5 hundredths              d) 50 thousandths

12. \_\_\_\_\_ Find the perimeter of the following polygon.



13. \_\_\_\_\_ Which of these is closest to the length of the pencil in this figure?



Which of these is closest to the length of the pencil in the figure?

- A. 9 cm  
B. 10.5 cm  
C. 12 cm  
D. 13.5 cm
14. Today is your first day as the Honorable Judge of the Teens' Court. This is a very important position because you will be making decisions that affect teens. Here is your first case: Four teens were hired to paint parts of a birdhouse for the school's nature trail. The teens' contract says that they would be paid a total of \$12.00. When the teens were paid, they couldn't decide how to share the money because the wall each teen painted wasn't the same shape. The walls that they painted were the following dimensions:

10 \_ 4 in - Student #1

9 \_ 3 in- Student #3

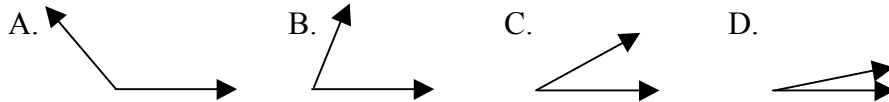
Your job as judge is to determine whether they should each receive the same amount of money. To make a fair decision, you need to conduct the following investigation.

- Draw a scale diagram on centimeter grid paper of each wall that was painted.
- Determine the area of each wall.
- Write your decision giving your opinion of how the money should be divided. Your decision should contain words to explain your thinking.

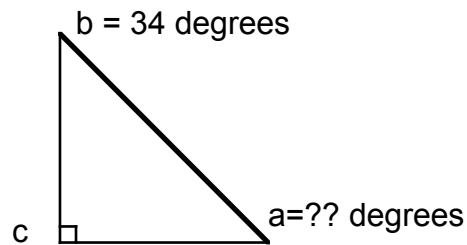
15. \_\_\_\_\_ Sam's house is about  $4\frac{1}{2}$  kilometers from school.  
About how far is this distance in meters?

- a) 4.5 m                      c) 450 m  
b) 4500 m                    d) 45,000 m

16. \_\_\_\_\_ Which of these angles has a measure closest to 30 degrees?



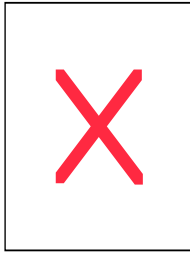
17. \_\_\_\_\_ Find the measure of angle A in the following right triangle.



18. \_\_\_\_\_ Two points determine a \_\_\_\_\_.

- a) line segment              c) ray

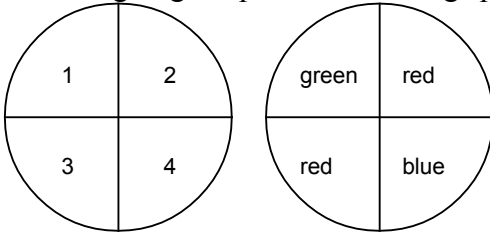
19. \_\_\_\_\_ b) point                      d) plane  
Give the most specific classification of this triangle based on its sides and its angles.



- a. Right Isosceles              c. Acute Equilateral  
b. Obtuse Scalene              d. Obtuse Isosceles
20. Draw a sketch of two parallel lines.
21. \_\_\_\_\_ How many lines of symmetry does a rectangle have?
22. Organize the test scores in a stem and leaf plot.  
65, 45, 78, 73, 94, 85, 81, 73, 98, 87, 83, 84, 97, 78, 86, 71, 84, 86.
23. A) Make a chart of all the possible sums of rolling 2 dice. One die is red and the other is green.
- B) What sum or sums would have the highest probability? Explain.

24. Runners from four different age groups ran in a marathon. The age groups were 20-29 year olds, 30-39 year olds, 40-49 year olds, and 50-59 year olds. The judges wanted to track all the runners finishing times. Explain why you would use a histogram instead of a bar graph.

25. You are going to spin the following spinners each once.



- a. List all the possible outcomes of spinning each spinner once.
- b. What is the probability of getting a 3 and a red when you spin each spinner once?
26. \_\_\_\_\_ Mindy is taking a test. She forgot to study, so she is guessing at the answer to a four choice multiple choice question. What is the probability that she will get the answer correct? Explain.
27. Using the following data; what is the range, mean, median, and mode of the test scores.  
65, 45, 78, 73, 94, 85, 81, 73, 98, 87, 83, 84, 97, 78, 86, 71, 84, 86

Range \_\_\_\_\_

Median \_\_\_\_\_

Mean \_\_\_\_\_

Mode \_\_\_\_\_

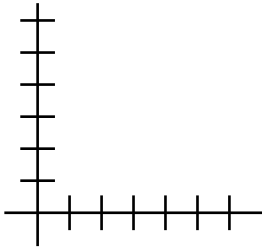
28. \_\_\_\_\_ What is missing? 7, 14, 21, \_\_, 35

- a) 17
- b) 28
- c) 24
- d) none of the above

29. Use a scatter plot to compare the family's ages and heights.

Dad 6'2"	42 years old
Mom 5'4"	40 years old
Son #1 6'4"	20 years old
Son #2 5'11"	17 years old
Daughter 5'2"	14 years old

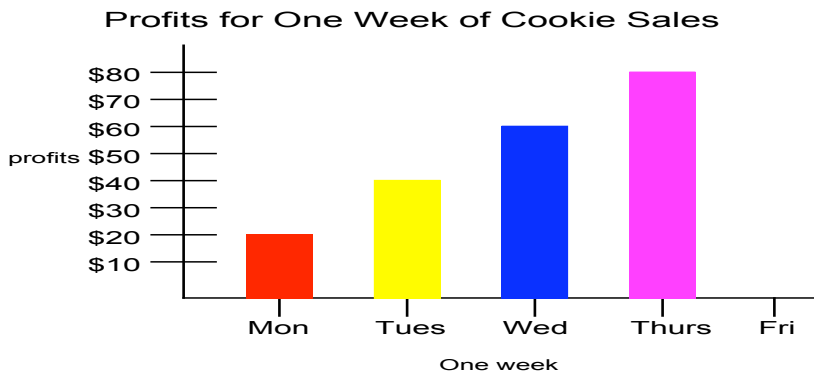
30. Graph the following ordered pair: (4,6 )



31. \_\_\_\_\_ Which of the following numbers makes this problem true:  $x + (6 + 4) = 29$

- a) 17
- b) 18
- c) 19
- d) 20

32. Using the following graph, if this pattern continues, determine what the profit would be for Friday. \_\_\_\_\_ Explain your answer.



33. June and Dan have \$60 together. June has 5 times as much money as Dan. How much money does Dan have? \_\_\_\_\_ Explain your answer using an equation, drawing, or another method of your choice.

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Answer Key

1. a
2. This will vary depending on the number chosen.
3. a
4. c
5. Step 2
6.  $2^4 = 2 \cdot 2 \cdot 2 \cdot 2 = 16$   
2 is the base number in this exponent and  $2 \cdot 2 = 4$ ,  $2 \cdot 2 = 4$ , and  $4 \cdot 4 = 16$   
Therefore, Kara is correct. John simply multiplied  $2 \cdot 4$ .
7. 3 cans for \$4.99 is approximately \$1.66 per can ( $4.99 / 3 = 1.66667$ )  
10 cans for \$12.99 is approximately \$1.30 per can ( $12.99 / 10 = 1.299$ )  
Therefore, buying 10 cans would be the better buy.
8. 0.3,  $1/3$ ,  $2/5$ , .75, 3
9. 1, 1, 1,  $1 \cdot 4 = 4$  each number rounds to one and I used cluster to figure my final answer

10. a.

1. Fraction	2. Equivalent fraction in simplest form
3. $6/8$	4. $3/4$
5. $2/10$	6. $1/5$
7. $5/20$	8. $1/4$
9. $20/25$	10. $4/5$

- b. The numerator and denominator of the original fraction should each be divided by the greatest common factor. That is the same as dividing by the identity of 1.
- c. The simplest form and the original fraction are equivalent. (examples will vary.)

11. c

12. 60 cm

13. b

14. a. Should be scale diagrams

- b. Student #1 – wall is 40 square cm      Student #2 – wall is 40 square cm  
Student #3 – Wall is 27 square cm      Student #4 – wall is 32 square cm
- c. The total area painted is 139 square cm. 40 square cm is 29% of this; 27 square cm is 19% and 32 square cm is 23%. Students #1 and #2 should each get 29% of \$12 or \$3.48. Student #3 should be 19% of \$12 or 2.28 and Student #4 should get 23% of \$12 or \$2.76.

15. b

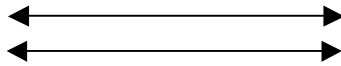
16. c

17. 56 degrees = a

18. a

19. b

20.



21. 2

22.

stem	leaves
4	5
6	5
7	1 3 3 8 8
8	1 3 4 4 5 6 6 7
9	4 7 8

23.  $r_{1,g1} = 2$   $r_{1,g2}$   $g_{2,r1} = 3$   $r_{1,g3}$   $r_{g1,r2}$   $g_{2,r2} = 4$   $r_{1,g4}$   $r_{4,g1}$   $r_{2,g3}$   $g_{3,r2} = 5$   $r_{1,g5}$   $r_{5,g1}$   $r_{2,g4}$   $r_{4,g2}$   $r_{3,g3} = 6$   $r_{1,g6}$   $r_{6,g1}$   $r_{2,g5}$   $r_{5,g2}$   $r_{3,g4}$   $g_{4,r3} = 7$   $r_{2,g6}$   $r_{6,g2}$   $r_{3,g5}$   $r_{5,g3}$   $r_{4,g4}$   $r_{3,g6}$   $r_{6,g3}$   $r_{4,g5}$   $r_{5,g4} = 9$   $r_{4,g6}$   $r_{6,g4}$   $r_{5,g5} = 10$   $r_{5,g6}$   $r_{6,g5} = 11$   $r_{6,g6}$  Out of 36 possible combinations. I found that the sum of 7 has six chances of coming up. Therefore, 7 is the most probable sum with a  $6/36$  or  $1/6$  chance of being rolled.

24. A histogram shows frequency using a range of data. This would best represent the age ranges given in the data. A bar graph should not be used to show a range of data.

25. a.  $1R_1, 1R_2, 1G, 1B; 2R_1, 2R_2, 2G, 2B; 3R_1, 3R_2, 3G, 3B; 4R_1, 4R_2, 4G, 4B;$

b. Probability of getting a red and a 3 is 2 out of 16 or  $1/8$ .

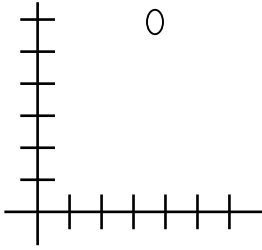
26. 25% 1 out of 4

27. Range: 49      Mean:  $74 \frac{3}{7}$       Median: 78      Mode: no mode

28. b

29. These should be shown on a scatter plot or bar graph. A line plot is not appropriate for this since it does not show continuous data.

30.



31.

32. c

33.

34. I would predict that Friday's profit to be about \$100. I noticed that each day increased by \$20 and with that pattern Friday will increase from \$80 to \$100.

Dan has \$10.

Dan ○                      June ○ ○ ○ ○ ○

The circles together are \$60 so each one represents \$10. Dan has \$10.

$$D + 5D = \$60 \quad D = \$10$$