Elementary Level
Mathematics Assessment
Multiple Choice Items

The PSSA Mathematics Assessment is given in grades 3 through 8 and 11.

- Look at the terms included here – you need to know these for the PSSA
- Look at the sample questions included here and practice – your teacher has the answers
- You will need to know the formulas for area and perimeter of a square and rectangle
- You will need to know the relationship between radius and diameter
- You will need to know how to compute means (averages)
- You will need to know the difference between mean, median, and mode
- Read the question several times and underline or highlight important information
- Try to solve the question before looking at the answer choices so you're not fooled by any choices
- Use the test book and extra paper to do your work
    - work slowly and neatly so you don't make any mistakes
    - check your mental math
    - write carefully and keep numbers in proper columns
    - copy carefully from the question
    - look carefully at units of measurement
    - draw a picture of the problem if it will help you
    - if you don't get the right answer, don't give up – try again, or try to solve the problem a different way
    - if all else fails, try each answer choice to see which one works to answer the question
- You will be able to use a calculator for some of the questions but not for all of them
- In the calculator section, **use** the calculator to check your answers
- Read all the answers carefully
- Watch out for trick answer choices - read the question carefully and choose the correct math operation
- When you finish the section, go back and check your work

Mathematics Assessment

Open Ended (Performance) Items

- Look at the sample question included here and practice using the rubric
- Look at the Sample Response for Category 5 (highest score) included here
- This is not multiple choice – you must provide the answer
- There are only a few of these questions, but they make up an important part of your score – **do not** skip these questions
- Do what you can, because you can get partial credit even if you make mistakes
- Read the question carefully, highlight important parts, and take your time
- Pay attention to how many solutions are required, and before you begin writing, divide your page so you will have enough space for all your work
- Write neatly
- Be sure to show all your work, even if you use a calculator
- If you used a calculator, explain what you did on the calculator (for example, "I entered 3 multiplied by 3 and I got 9.")
- Explain every step of your math and why you chose to perform that math – make sure that your explanation is easy for somebody else to read and understand
- Try to use these words when you write your explanation:
  - to get
  - to find
  - to figure out
  - to show
  - because
  - since
  - therefore
- Use fifth grade words in your explanation
  - instead of *plus*, write **sum**
  - instead of *times*, write **multiplied by**
  - instead of *answer*, write **product**
  - also use **divisor**, **dividend**, **quotient**
- You may want to make two columns on the answer page, like this:

WORK	EXPLANATION
show the math calculations, the numbers, and the solutions here	use words to describe **each step** of your work here

Terms used in the Academic Standards for Mathematics through Grade 5[3]

1. Acute Angle
2. Area
3. Composite Number
4. Congruent
5. Element
6. Equilateral
7. Expanded Notation
8. Factors
9. Hypotenuse
10. Isosceles Triangle
11. Least
12. Leg
13. Maximum
14. Mean
15. Median
16. Minimum
17. Mode
18. Multiples
19. Negative Number
20. Obtuse Angle
21. Parallel
22. Parallelogram
23. Pattern
24. Perimeter
25. Perpendicular
26. Polygon
27. Prime Number
28. Probability
29. Quadrilateral
30. Range
31. Right Angle
32. Right Triangle
33. Scalene Triangle
34. Similar
35. Symmetrical
36. Tessellation
37. Trapezoid
38. Tree Diagram
39. Triangle
40. Venn Diagram
41. Volume

[3]This list was developed by Elizabeth Aulbach of Central York School District, a member of the Grade 5 Mathematics Assessment Advisory Committee.

You may <u>not</u> use a calculator for items 1–3.

1. 450 children each have 16 pieces of candy. Altogether how many pieces of candy do they have?

A. 2812
B. 7200
C. 7250
D. 7400

2. A total of 106,789 people attended the Rose Bowl football game. If the average ticket price was $21.52, **about** how much money did the Rose Bowl take in?

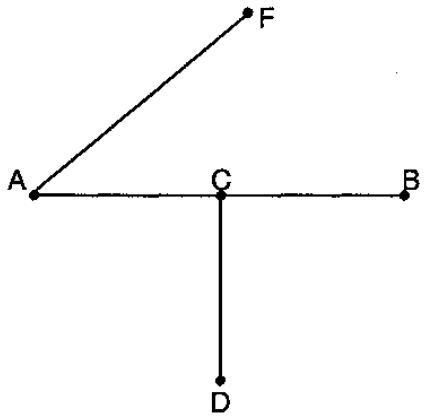
A. $ 20,000
B. $ 200,000
C. $ 2,000,000
D. $ 20,000,000

3. Justin buys 2 cheeseburgers at $1.55 each, large fries for $.95, and a vanilla shake for $1.25. How much change will Justin receive from $10.00?

A. $4.50
B. $4.70
C. $4.75
D. $5.00

You may use a calculator for the rest of the questions on this test.

4. Use the ruler provided to measure $\overline{AB}$, $\overline{CD}$, and $\overline{AF}$. Then calculate the **sum** of their lengths.



A. 2 inches

B. $3\frac{1}{2}$ inches

C. 4 inches

D. $4\frac{1}{2}$ inches

5. What number fills the ☐ to correctly complete this pattern?

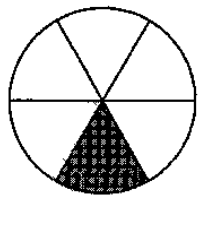
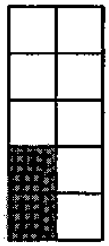
3, 1, 4, 2, 5, ☐ , 6

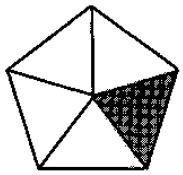
A. 1
B. 2
C. 3
D. 4

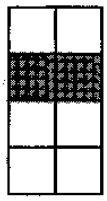
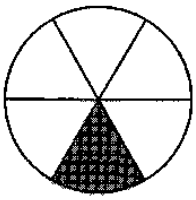
6. When Joseph throws darts, he is able to hit a target one-half of the time. If he throws 36 darts, how many times would he expect to hit the target?

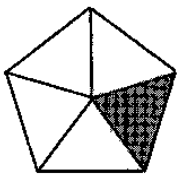
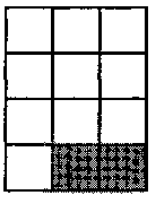
   A. 18 times
   B. 5 times
   C. 8 times
   D. 14 times

7. Which of the following sets shows $\frac{1}{4}$ and $\frac{1}{6}$ shaded?

A.  

B.  

C.  

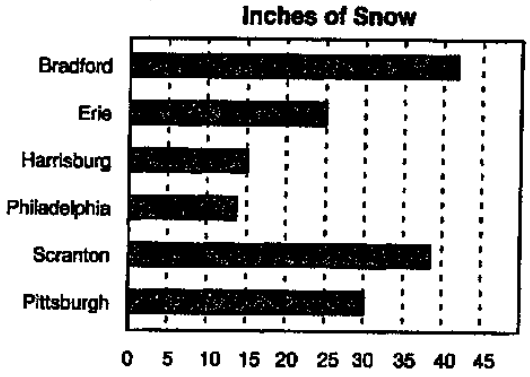
D.  

8. I am a dogpen with 6 sides and 6 angles. What geometric shape am I?

   A. triangle
   B. pentagon
   C. hexagon
   D. octagon

Use the graph below to answer items 9 and 10.

The bar graph shows the number of inches that fell one year in December in each of the cities shown.



9. What city had twice as many inches of snow as Harrisburg?

   A. Erie
   B. Philadelphia
   C. Bradford
   D. Pittsburgh

10. What city had the **least** amount of snow?

   A. Philadelphia
   B. Erie
   C. Harrisburg
   D. Pittsburgh

11. Which item is an example of a rectangular prism?

A. 

cereal box

B.  can

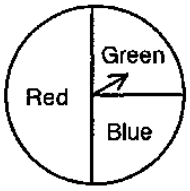
C.  baseball

D.  pencil

12. Which of the following numbers has both 2 and 3 as factors?

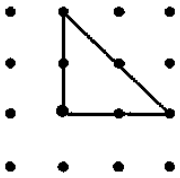
A. 15
B. 23
C. 18
D. 22

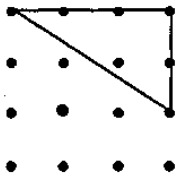
13. The figure below shows a spinner with 3 colored areas. One of the areas is twice as large as the other two. If the spinner is spun 100 times, the best prediction would be that the pointer would stop on red ____ out of 100 times.

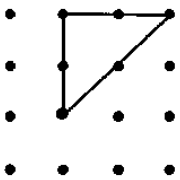


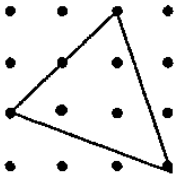
A. 50
B. 25
C. 10
D. 75

14. Which drawing is **not** a right triangle?

A. 

B. 

C. 

D. 

15. Mrs. Gonzalez had twins weighing 6 lb 9 oz and 5 lb 13 oz. What was the total weight of both babies?

A. 12 lb 22 oz
B. 12 lb 10 oz
C. 12 lb 6 oz
D. 11 lb 10 oz

16. Which fractions are in order from the **greatest to least**?

A. $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$

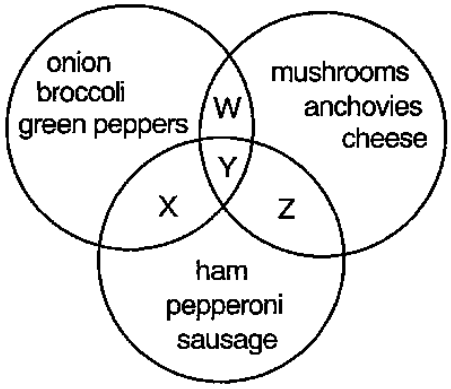
B. $\frac{1}{2}, \frac{4}{4}, \frac{3}{6}$

C. $\frac{1}{3}, \frac{1}{2}, \frac{1}{6}$

D. $\frac{2}{3}, \frac{3}{4}, \frac{2}{5}$

17. Use the figure (Venn diagram) below to decide where a pizza with onions, mushrooms and pepperoni belongs.

PIZZA TOPPING CHOICES



A. W
B. X
C. Y
D. Z

18. Three children are growing flowers. Maria's flower is 3 inches shorter than Leslie's flower, but Maria's flower is 4 inches taller than Laura's. If Leslie's flower is 10 inches tall, how tall is Laura's?

A. 3 inches
B. 14 inches
C. 7 inches
D. 13 inches

19. Lenny has $7.25. Candy bars cost $.75 apiece. What is the **greatest** number of candy bars he can buy?

A. 5 candy bars
B. 8 candy bars
C. 9 candy bars
D. 10 candy bars

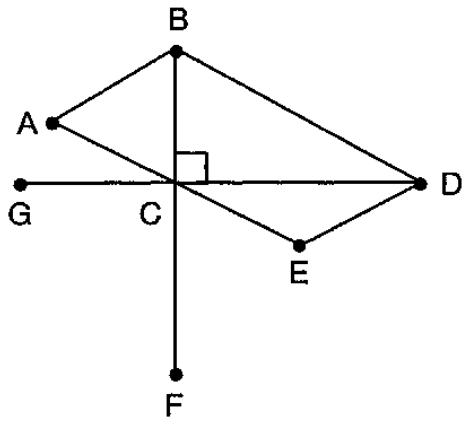
20. Find the perimeter of a rectangular swimming pool having sides of 30 ft and 10 ft.

A. 300 ft
B. 80 ft
C. 150 ft
D. 40 ft

21. In which number does the underlined 5 represent 5 million?

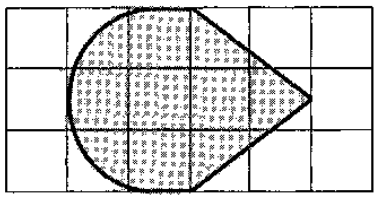
A. 355,057,531
B. 355,057,531
C. 355,057,531
D. 355,057,531

22. Which line segment is the hypotenuse of a right triangle?



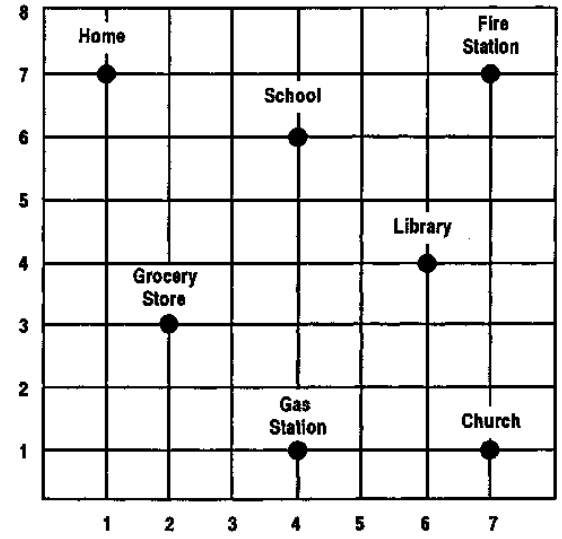
A. $\overline{CD}$
B. $\overline{BC}$
C. $\overline{CE}$
D. $\overline{BD}$

23. Each block on the grid equals 1 square unit. **Estimate** the **area** of the shaded figure.



A. 5 square units
B. 8 square units
C. 11 square units
D. 13 square units

24. Which two places are found at coordinates (4,6) and (7,1)?



A. school and home
B. school and church
C. library and fire station
D. library and church

25. A baseball helmet weighs more than a bicycle helmet. A race-car driver's helmet weighs more than a baseball helmet. The weight of a football helmet is between the weight of a bicycle helmet and the weight of a race-car driver's helmet. Which helmet weighs the **most**?

A. the baseball helmet
B. the bicycle helmet
C. the football helmet
D. the race-car helmet

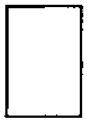
26. The daily high temperatures in the desert for the first three days of the week were 105°, 100° and 95°. What must the fourth day's high temperature be for the average high temperature to be exactly 100°?

A. 105°
B. 100°
C. 95°
D. 110°

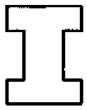
27. What is the **most** reasonable unit to use to measure the height of an oak tree?

A. millimeters
B. centimeters
C. meters
D. kilometers

28. Which of the following figures has exactly one line of symmetry?

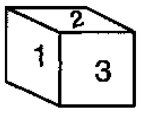
A. 

B. 

C. 

D. 

29. The cube shown below is numbered from 1 to 6. What is the probability of rolling an odd number with this cube?



A. $\frac{1}{6}$

B. $\frac{3}{6}$

C. $\frac{2}{6}$

D. 0

30. Art climbed eight feet up a tree. Jay climbed 94 inches up the tree. How much **farther** did Art climb?

A. 2 inches
B. 22 inches
C. 12 inches
D. 6 inches

31. Joe has a **total** of $14. He earned $3 of it washing dishes. The rest he earned mowing lawns. Which equation should he use to find how much money he earned mowing lawns?

A. $14 + 3 = 17$
B. $3x = 14$
C. $17 - x = 3$
D. $x + 3 = 14$

32. Daniel drove 480 km in 4 hours. If Daniel continues driving at the same speed, how long will it take him to drive an additional 720 km?

A. 18 hours
B. 12 hours
C. 6 hours
D. 3 hours

Figure 3
Mathematics General Problem Solving Rubric

5 - Advanced Understanding, Excellent

- Correct answer with correct procedures/correct calculations shown or described and a written explanation that supports the work shown. The explanation tells what was done in the solution process and explains **why** the steps were done (or the reason(s) for the steps to be taken). No blemishes, that is, everything is correct. May have a minor omission in calculation or explanation where the omitted step or explanation may be of the level of 2 + 2 = 4 (something that is usually done mentally and considered trivial and understood).

4 - Satisfactory Understanding

- Correct answer with correct procedures/correct calculations shown or described and a written explanation which supports some of the work shown. May have minor omission in calculation or explanation (such as 2 + 2 = 4).

3 - Almost Satisfactory Understanding

- Correct answer with most correct procedures/calculations shown or described and no explanation. Some steps are missing, but you can follow what is being done.
- Correct answer with few correct procedures/calculations shown or described and some explanation. Some steps are missing, but you can follow what is being done.
- Incorrect answer with correct procedures shown or described and some explanation, but with one calculation or copying error carried through.

2 - Partial Understanding

- Correct answer with few procedures/calculations shown or described or some explanation. Too many steps are missing to follow what is being done.
- Incorrect answer with half or more correct procedures shown or described and some or no explanation. The student either did not proceed far enough or proceeded incorrectly.
- Incorrect answer with correct procedures shown or described and no explanation. May have no more than 2 calculation or copying errors.

1 - Minimal Understanding

- Correct answer with calculations, procedures or explanation that are either not legible or not understandable or missing or the procedure is incorrect. Less than a "2" score.
- No answer or an incorrect answer, but the student has provided some of the information critical to the solution. There is some indication that the student has read the item.

0 - Incorrect

- Incorrect answer in which the student attempts the task incorrectly or gives an incorrect or incomplete answer with an incorrect explanation or no explanation of the procedure or logic used in the solution. Nothing is correct.
- Blank responses and Off-Task responses (profanity, refusal to perform, unrelated drawings or comments such as "doodles") are scored as "Incorrect responses."
- Question marks and "I don't know" are scored as "Incorrect responses." The student has read the task and responded to it.
- No answer is treated as an incorrect answer.

33. Some fifth graders competed in a field-day race. The fifth-grade results for the 50-meter race are shown in the chart below.

Runner	Time in Seconds
Andrew	8.05
Tia	7.68
José	8.98
Rose	7.86
Matt	8.28
Donna	8.72

A) List the runners from **fastest** to **slowest**. **REMEMBER:** the **runner completing** the race in the **least amount of time** is the **winner.**

GO TO THE NEXT PAGE TO FINISH QUESTION 33.

33. ***Continued***. Please refer to previous page for task explanation.

B) CALCULATE the **average time** for the fifth grade. **Which runner's time was closest to the average for fifth grade?** CALCULATE by how much time this student's time **differed from** the average.

WRITE each step of your math work.
EXPLAIN why you did each step.
WRITE your answers in the **box below.**

Answers:

_____ Average time

_____ Runner whose time was closest to the average.

_____ Amount by which this runner's time differed from the average.

GO ON

Grade 5 Sample Response for Category 5

A) **LIST** all the possible combinations which could occur when the 2 spinners are spun. There are **16 possible** combinations. The first one has been completed for you on the chart below.

COMPLETE the chart to find the remaining combinations and their products.

Spinner 1	4	1	2	3	2	4	3	1	2	1	3	1	3	4	2	4
Spinner 2	1	4	2	2	3	3	4	1	1	2	3	3	1	2	4	4
Product	4	4	4	6	6	12	12	1	2	2	9	3	3	8	8	16
	5	5	4	5	5	7	7	2	3	3	6	4	4	6	6	8

B) **LOOK** at all the combinations in the chart above.

Who has the better chance of winning the game?

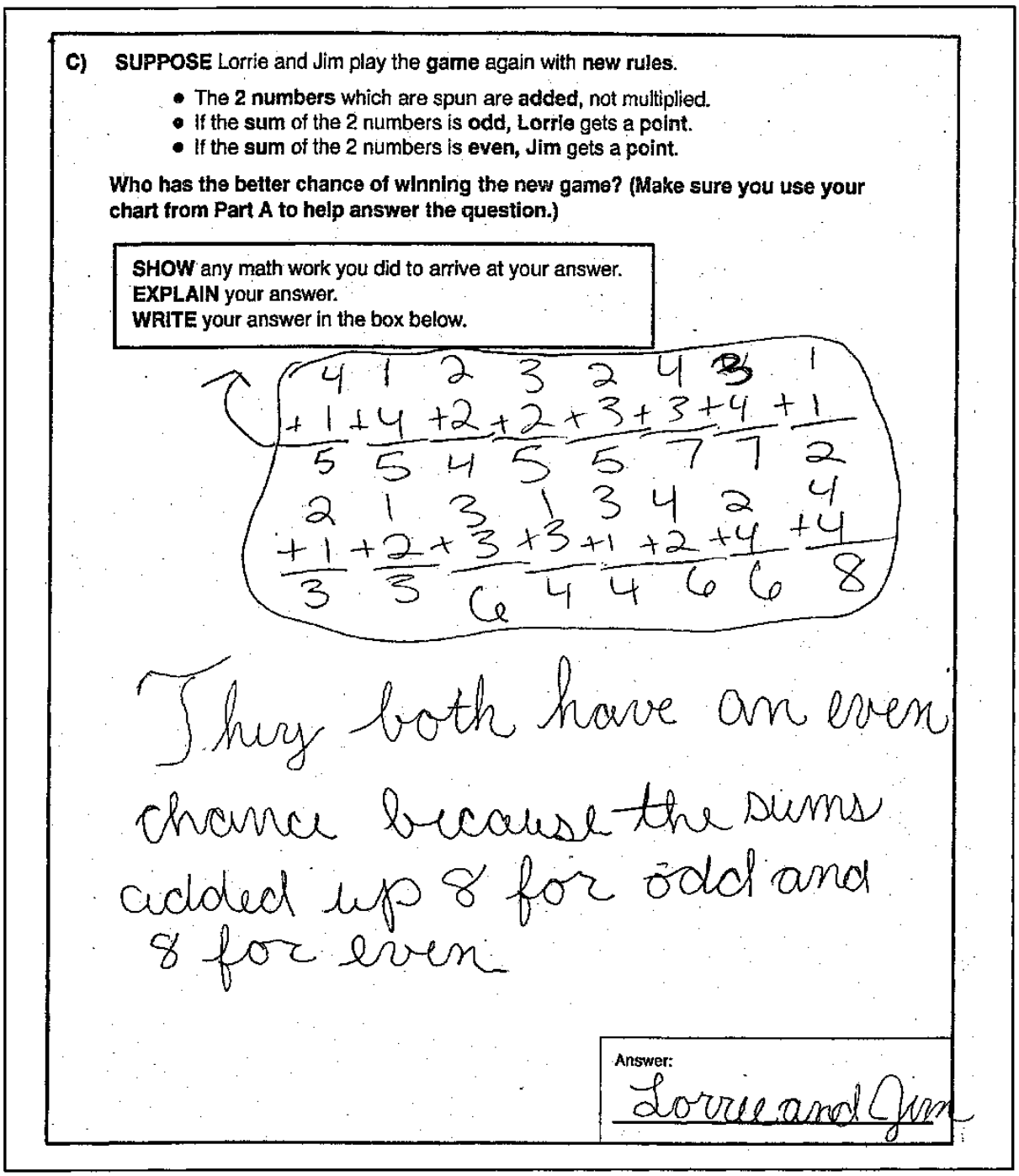
REMEMBER: Lorrie gets a point for each **odd product.**
Jim gets a point for each **even product.**
EXPLAIN your answer.
WRITE your answer in the box below.

Jim has a a better chance of wining the game because out of the 16 comoations 12 were even and 4 were odd.

Answer: Jim

Response continued on the following page.

Grade 5 Sample Response for Category 5 (continued)



C) **SUPPOSE** Lorrie and Jim play the **game** again with **new rules.**

- The **2 numbers** which are spun are **added,** not multiplied.
- If the **sum** of the 2 numbers is **odd, Lorrie** gets a **point.**
- If the **sum** of the 2 numbers is **even, Jim** gets a **point.**

Who has the better chance of winning the new game? (Make sure you use your chart from Part A to help answer the question.)

SHOW any math work you did to arrive at your answer.
EXPLAIN your answer.
WRITE your answer in the box below.

4 1 2 3 2 4 3 1
+1 +4 +2 +2 +3 +3 +4 +1
5 5 4 5 5 7 7 2

2 1 3 1 3 4 2 4
+1 +2 +3 +3 +1 +2 +4 +4
3 3 6 4 4 6 6 8

They both have an even chance because the sums added up 8 for odd and 8 for even

Answer: Lorrie and Jim

5 - All nine possible points are earned. In part A all 15 combinations and products are correctly listed (3 points). In part B the player with the better chance of winning is chosen and the choice is justified with an accurate discussion of probability. A comparison is made between the number of possible odd and even products out of the total of 16 combinations (3 points). In part C a tie is indicated with a justification that is based on probability concepts (3 points).