



New York State Testing Program

Mathematics

Scoring Guide for Sample Test 2005

Grade 7

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Strand and Performance Indicator Map with Answer Key

Grade 7, Book 1					
Question	Type	Points	Strand	Content Performance Indicator	Answer Key
1	Multiple Choice	1	Number Sense and Operations	7.N.9	C
2	Multiple Choice	1	Algebra	7.A.1	G
3	Multiple Choice	1	Statistics and Probability	6.S.3	A
4	Multiple Choice	1	Number Sense and Operations	7.N.6	H
5	Multiple Choice	1	Geometry	7.G.3	B
6	Multiple Choice	1	Statistics and Probability	6.S.11	H
7	Multiple Choice	1	Number Sense and Operations	7.N.1	A
8	Multiple Choice	1	Measurement	7.M.9	F
9	Multiple Choice	1	Statistics and Probability	6.S.10	B
10	Multiple Choice	1	Number Sense and Operations	7.N.11	H
11	Multiple Choice	1	Geometry	6.G.10	D
12	Multiple Choice	1	Statistics and Probability	7.S.4	G
13	Multiple Choice	1	Number Sense and Operations	7.N.8	B
14	Multiple Choice	1	Measurement	7.M.2	J
15	Multiple Choice	1	Statistics and Probability	7.S.10	C
16	Multiple Choice	1	Number Sense and Operations	7.N.12	G
17	Multiple Choice	1	Algebra	7.A.1	C
18	Multiple Choice	1	Statistics and Probability	7.S.10	H
19	Multiple Choice	1	Number Sense and Operations	7.N.15	A
20	Multiple Choice	1	Geometry	7.G.1	F
21	Multiple Choice	1	Statistics and Probability	7.S.2	B
22	Multiple Choice	1	Number Sense and Operations	7.N.7	F
23	Multiple Choice	1	Measurement	7.M.4	A
24	Multiple Choice	1	Statistics and Probability	6.S.10	F
25	Multiple Choice	1	Number Sense and Operations	7.N.9	B
26	Multiple Choice	1	Geometry	6.G.11	H

Strand and Performance Indicator Map with Answer Key

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
27	Multiple Choice	1	Statistics and Probability	7.S.6	B
28	Multiple Choice	1	Number Sense and Operations	7.N.11	H
29	Multiple Choice	1	Measurement	7.M.3	D
30	Multiple Choice	1	Statistics and Probability	6.S.11	J
Grade 7, Book 2					
31	Short Response	2	Algebra	6.A.4	n/a
32	Extended Response	3	Number Sense and Operations	7.N.10	n/a
33	Short Response	2	Measurement	7.M.11	n/a
34	Extended Response	3	Statistics and Probability	7.S.3	n/a
35	Short Response	2	Algebra	6.A.5	n/a
36	Extended Response	3	Geometry	7.G.4	n/a
37	Short Response	2	Statistics and Probability	7.S.8	n/a
38	Extended Response	3	Number Sense and Operations	7.N.19	n/a

2-Point Holistic Rubric

Score Points:

2 Points	<p>A two-point response is complete and correct.</p> <p>This response</p> <ul style="list-style-type: none">• demonstrates a thorough understanding of the mathematical concepts and/or procedures embodied in the task• indicates that the student has completed the task correctly, using mathematically sound procedures• contains clear, complete explanations and/or adequate work when required
1 Point	<p>A one-point response is only partially correct.</p> <p>This response</p> <ul style="list-style-type: none">• indicates that the student has demonstrated only a partial understanding of the mathematical concepts and/or procedures embodied in the task• addresses some elements of the task correctly but may be incomplete or contain some procedural or conceptual flaws• may contain an incorrect solution but applies a mathematically appropriate process• may contain a correct numerical answer but required work is not provided
0 Points	<p>A zero-point response is incorrect, irrelevant, incoherent, or contains a correct response arrived at using an obviously incorrect procedure. Although some parts may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.</p>

Condition Code A

Condition Code A is applied whenever a student who is present for a test session leaves an entire open-ended item in that session blank (no response).

3-Point Holistic Rubric

Score Points:

3 Points	<p>A three-point response is complete and correct.</p> <p>This response</p> <ul style="list-style-type: none">• demonstrates a thorough understanding of the mathematical concepts and/or procedures embodied in the task• indicates that the student has completed the task correctly, using mathematically sound procedures• contains clear, complete explanations and/or adequate work when required
2 Points	<p>A two-point response is partially correct.</p> <p>This response</p> <ul style="list-style-type: none">• demonstrates partial understanding of the mathematical concepts and/or procedures embodied in the task• addresses most aspects of the task, using mathematically sound procedures• may contain an incorrect solution but provides complete procedures, reasoning, and/or explanations• may reflect some misunderstanding of the underlying mathematical concepts and/or procedures
1 Point	<p>A one-point response is incomplete and exhibits many flaws but is not completely incorrect.</p> <p>This response</p> <ul style="list-style-type: none">• demonstrates only a limited understanding of the mathematical concepts and/or procedures embodied in the task• may address some elements of the task correctly but reaches an inadequate solution and/or provides reasoning that is faulty or incomplete• exhibits multiple flaws related to a misunderstanding of important aspects of the task, misuse of mathematical procedures, or faulty mathematical reasoning• reflects a lack of essential understanding of the underlying mathematical concepts• may contain a correct numerical answer but required work is not provided
0 Points	<p>A zero-point response is incorrect, irrelevant, incoherent, or contains a correct response arrived at using an obviously incorrect procedure. Although some parts may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.</p>

Scoring Policies for Mathematics

1. If the question does **not** specifically direct students to show their work, teachers may **not** score any work that the student shows.
2. If the student does the work in other than a designated “Show your work” area, that work may still be scored.
3. If the question requires students to show their work, and the student shows appropriate work and clearly identifies a correct answer but fails to write that answer in the answer blank, the student should still receive full credit.
4. If the question requires students to show their work, and a student shows appropriate work and arrives at the correct answer but writes an incorrect answer in the answer blank, the student may **not** receive full credit.
5. If the student provides one legible response (and one response only), teachers should score the response, even if it has been crossed out.
6. If the student has written more than one response but has crossed some out, teachers should score only the response that has not been crossed out.
7. For questions in which students use a trial-and-error (guess-and-check) process, evidence of three rounds of trial-and-error must be present for the student to receive credit for the process. Trial-and-error items are **not** subject to Scoring Policy #6, since crossing out is part of the trial-and-error process.
8. If a response shows repeated occurrences of the same conceptual error within a question, the student should not be penalized more than once.
9. In questions that provide ruled lines for the students to write an explanation of their work, mathematical work shown elsewhere on the page may be considered and scored if, and only if, the student explicitly points to the work as part of the answer.
10. Responses containing a conceptual error may **not** receive more than fifty percent of the maximum score.
11. In all questions that provide a response space for one numerical answer and require work to be shown, if the correct numerical answer is provided but no work is shown, the score is 1.
12. In all questions that provide response spaces for two numerical answers and require work to be shown for both parts, if one correct numerical answer is provided but no work is shown in either part, the score is 0. If two correct numerical answers are provided but no work is shown in either part, the score is 1.
13. In all 3-point questions that provide response spaces for two numerical answers and require work to be shown in one part, if two correct numerical answers are provided but no work is shown, the score is 2.

Content-Specific Scoring Clarifications for Mathematics Tests

1. All necessary signs of operation should be present for work to be considered mathematically complete and correct. If signs of operation in the work shown are missing and it is absolutely clear and apparent in the student's work which operation is being used, and all other work required is correct, the student should receive full credit.
2. In questions that require students to provide bar graphs, touching bars are acceptable only at Grades 3 and 4.
3. If the question asks the student to provide an expression and the student provides an equation, this is an acceptable response at Grades 3 and 4 only.

For additional clarification, see the web site <http://www.emsc.nysed.gov/ciai/mst/instructrec.htm>.

31

Erin shops at two stores for a new sweater. The sweater at the first store costs \$15 less than three times the cost, c , of the sweater at the second store. The sweater at the first store costs \$90. The equation below can be used to determine the cost of the sweater at the second store.

$$3c - 15 = 90$$

Solve the equation to find the cost of the sweater at the second store.

Show your work.

Answer \$ _____

QUESTION 31

STRAND 2: ALGEBRA

Complete and Correct Response:

- $3c - 15 = 90$
 $3c = 105$
 $c = 35$

OR other valid process

AND

- \$35

Score Points:

Apply 2-point holistic rubric

31

Erin shops at two stores for a new sweater. The sweater at the first store costs \$15 less than three times the cost, c , of the sweater at the second store. The sweater at the first store costs \$90. The equation below can be used to determine the cost of the sweater at the second store.

$$3c - 15 = 90$$

Solve the equation to find the cost of the sweater at the second store.

Show your work.

$$\begin{array}{r} 3c - 15 = 90 \\ \cancel{3} + \cancel{15} + 15 \\ \hline 105 \\ \hline c = \$35 \end{array}$$

$$\begin{array}{r} 35 \\ 3 \overline{)105} \\ \underline{-9} \\ 15 \end{array}$$

Answer \$ 35

This response is complete and correct.

Score Point - 2

31

Erin shops at two stores for a new sweater. The sweater at the first store costs \$15 less than three times the cost, c , of the sweater at the second store. The sweater at the first store costs \$90. The equation below can be used to determine the cost of the sweater at the second store.

$$3c - 15 = 90$$

Solve the equation to find the cost of the sweater at the second store.

Show your work.

$$\begin{array}{r} 3c - 15 = 90 \\ \underline{-15} \quad \underline{-15} \\ 3c \quad \quad 75 \\ \hline c = \$25.00 \end{array}$$

$$\begin{array}{r} 25 \\ 3 \overline{)75} \\ \underline{-6} \\ 15 \\ \underline{-15} \\ 0 \end{array}$$

Answer \$ 25.00

This response is only partially correct. The final step in the process for solving the equation is addressed correctly. However, the initial step in the process is mathematically flawed by subtracting 15 from both sides instead of adding, resulting in an incorrect answer.

Score Point - 1

31

Erin shops at two stores for a new sweater. The sweater at the first store costs \$15 less than three times the cost, c , of the sweater at the second store. The sweater at the first store costs \$90. The equation below can be used to determine the cost of the sweater at the second store.

$$3c - 15 = 90$$

Solve the equation to find the cost of the sweater at the second store.

Show your work.

Handwritten work showing the solution to the equation $3c - 15 = 90$. The student adds 90 to both sides to get $3c = 180$, then divides by 3 to get $c = 60$. However, the student incorrectly subtracts 15 from 180 to get 165, which is circled.

Answer \$ 265

This response is completely incorrect.

Score Point - 0

32

Mr. Hardy assigns homework to his mathematics class. The assignment requires students to find the prime factorization of 648.

Part A

What is the prime factorization of 648?

Show your work.

Answer _____

Part B

Write the result of the prime factorization of 648 in exponential form.

Answer _____

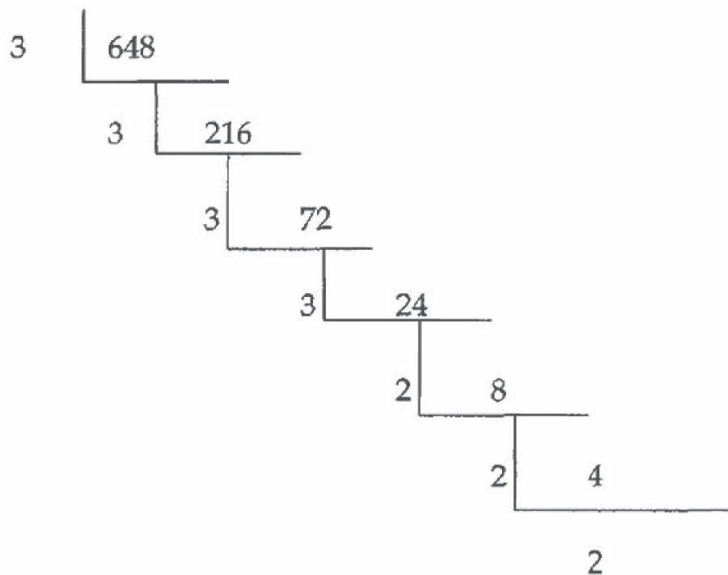
QUESTION 32

STRAND 1: NUMBER SENSE AND OPERATIONS

Complete and Correct Response:

Part A

•



OR other valid process

AND

• $3 \times 3 \times 3 \times 3 \times 2 \times 2 \times 2$

AND

Part B

• $3^4 \times 2^3$

Score Points:

Apply 3-point holistic rubric

32

Mr. Hardy assigns homework to his mathematics class. The assignment requires students to find the prime factorization of 648.

Part A

What is the prime factorization of 648?

Show your work. 2, 3, 5, 7, 11

Handwritten work showing prime factorization of 648 using a ladder method. The factors are 2, 3, 3, 3, 3, 2. There are also some vertical scribbles on the right side of the work.

$$\begin{array}{r} 2 \\ 3 \overline{) 6} \\ 3 \overline{) 18} \\ 3 \overline{) 54} \\ 3 \overline{) 108} \\ 3 \overline{) 324} \\ 2 \overline{) 648} \end{array}$$

Answer 2 · 3 · 3 · 3 · 3 · 2

Part B

Write the result of the prime factorization of 648 in exponential form.

Answer 2³ · 3⁴

This response is complete and correct.

Score Point - 3

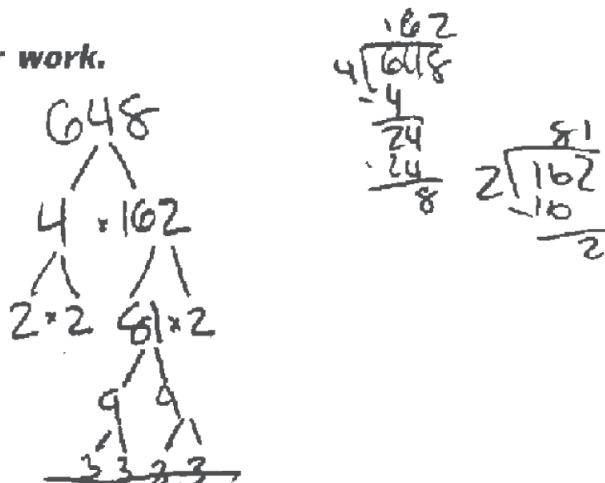
32

Mr. Hardy assigns homework to his mathematics class. The assignment requires students to find the prime factorization of 648.

Part A

What is the prime factorization of 648?

Show your work.



Answer $2^3 + 9^2 + 3^4 = 648$

Part B

Write the result of the prime factorization of 648 in exponential form.

Answer $2^5 + 9^2 + 3^4 = 648$

This response is incomplete and exhibits many flaws but is not completely incorrect. 648 is factored correctly; however, the answers in Part A and B do not reflect the work shown.

Score Point - 1

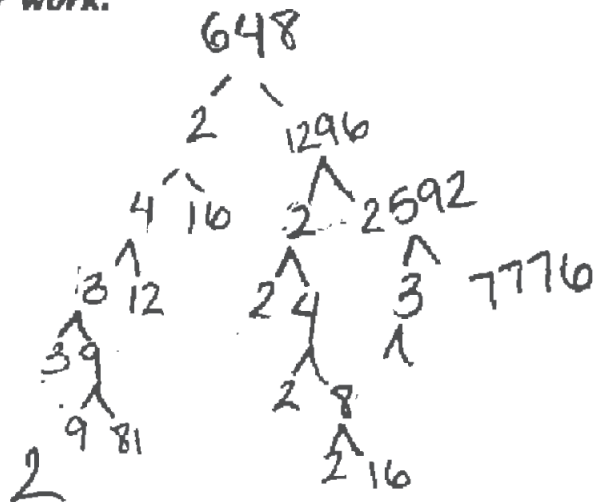
32

Mr. Hardy assigns homework to his mathematics class. The assignment requires students to find the prime factorization of 648.

Part A

What is the prime factorization of 648?

Show your work.



Answer _____

Part B

Write the result of the prime factorization of 648 in exponential form.

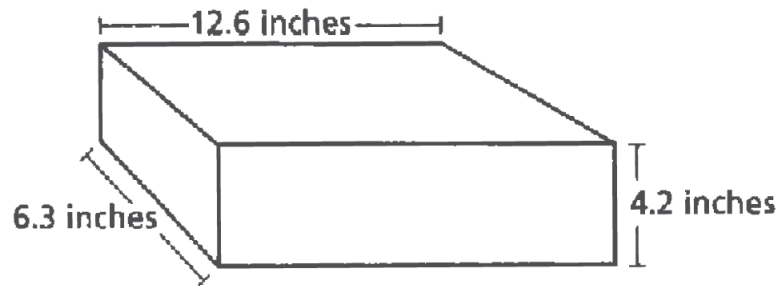
Answer _____

This response is incorrect, and the work shown is not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

Score Point - 0

33

Keisha wants to paint the entire outside of her rectangular storage box shown in the diagram below.



[not drawn to scale]

Use estimation to calculate the total surface area, in square inches, of the storage box.

Show your work.

Answer _____ square inches

QUESTION 33

STRAND 4: MEASUREMENT

Complete and Correct Response:

- Total surface area = $2 \times 6 \times 13 + 2 \times 13 \times 4 + 2 \times 6 \times 4$
= $156 + 104 + 48$
= 308 square inches

OR other valid process

AND

- 308 square inches

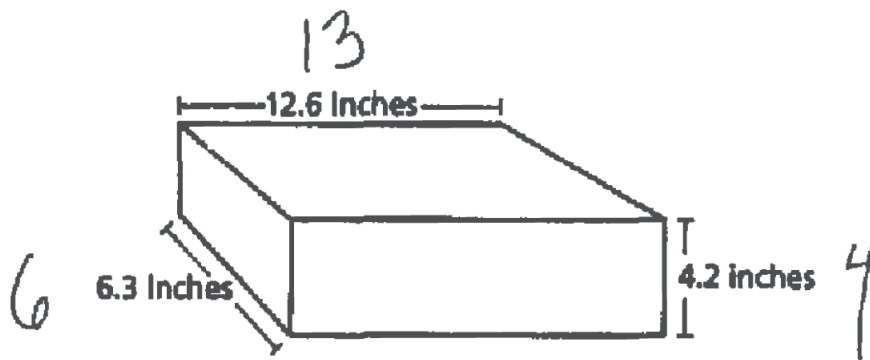
OR other valid estimate which follows a valid process

Score Points:

Apply 2-point holistic rubric

33

Keisha wants to paint the entire outside of her rectangular storage box shown in the diagram below.



[not drawn to scale]

Use estimation to calculate the total surface area, in square inches, of the storage box.

Show your work.

$$\begin{aligned} 6 \times 4 &= 24 \\ 13 \times 4 &= 52 \\ 13 \times 6 &= 78 \end{aligned}$$

$$\begin{array}{r} 24 \\ 24 \\ 52 \\ 52 \\ 78 \\ 78 \\ \hline 308 \end{array}$$

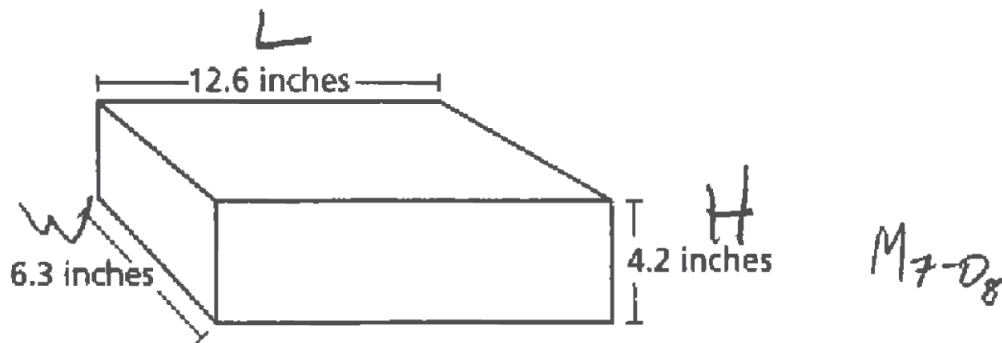
Answer 308 square inches

The work shown clearly indicates the estimation of all side lengths and results in a correct answer of 308 square inches.

Score Point - 2

33

Keisha wants to paint the entire outside of her rectangular storage box shown in the diagram below.



[not drawn to scale]

Use estimation to calculate the total surface area, in square inches, of the storage box.

Show your work.

$$\begin{aligned}
 &2wl + 2lh + 2wh \\
 &2(6.3 \times 12.6) + 2(12.6 \cdot 4.2) + 2(6.3 \cdot 4.2) \\
 &2 \cdot 79.38 + 2 \cdot 52.95 + 2 \cdot 26.46 \\
 &158.76 + 105.9 + 52.98
 \end{aligned}$$

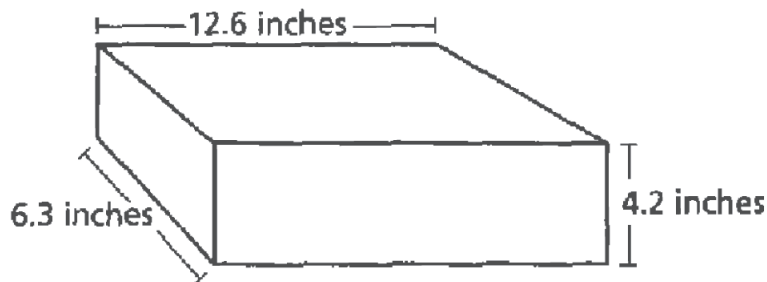
Answer 317.64 square inches

This response is only partially correct. Although the procedure for calculating surface area is correct, the estimation procedure is not applied.

Score Point - 1

33

Keisha wants to paint the entire outside of her rectangular storage box shown in the diagram below.



[not drawn to scale]

Use estimation to calculate the total surface area, in square inches, of the storage box.

Show your work.

$$\begin{array}{r} 13 \\ 13 \end{array} \rangle 26 \\ \begin{array}{r} 6 \\ 6 \end{array} \rangle 12 \\ \begin{array}{r} 4 \\ 4 \end{array} \rangle 8 \\ \hline 46$$

Answer 46 square inches

This response is completely incorrect. The estimated side lengths shown in the work area are not sufficient to demonstrate even a partial understanding of how to estimate the surface area of a multi-dimensional figure.

Score Point - 0

34

The Roosevelt Middle School band has monthly fundraisers. The table below shows the amount of money the band raises and their fundraising expenses each month for four months.

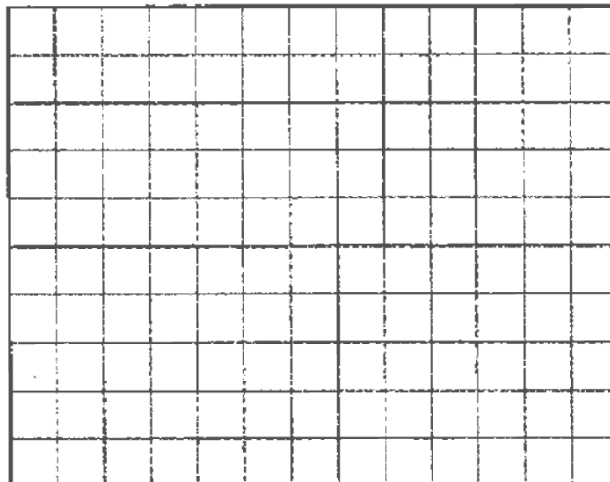
BAND FUNDRAISERS

Month	Amount raised	Expenses
September	\$125	\$50
October	\$275	\$75
November	\$450	\$125
December	\$100	\$25

Based on the data in the table, create a double-bar graph on the grid below to show the amount of money the band raises and the fundraising expenses for each month.

Be sure to

- title the graph
- label the axes
- provide an appropriate key for the graph
- graph all the data



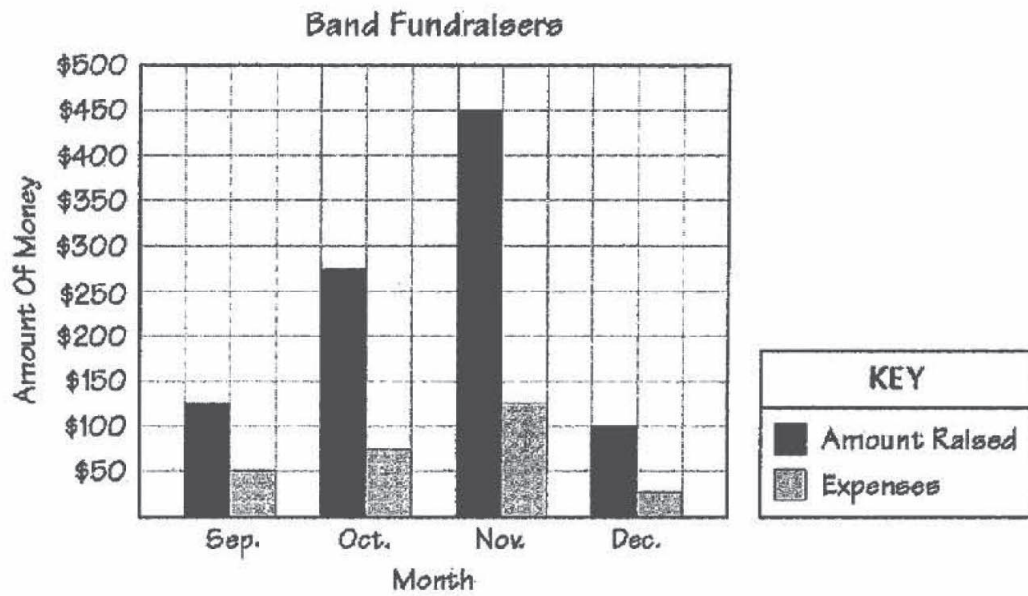
KEY

QUESTION 34

STRAND 5: STATISTICS AND PROBABILITY

Complete and Correct Response:

-



OR other valid double bar graph

Score Points:

Apply 3-point holistic rubric

34

The Roosevelt Middle School band has monthly fundraisers. The table below shows the amount of money the band raises and their fundraising expenses each month for four months.

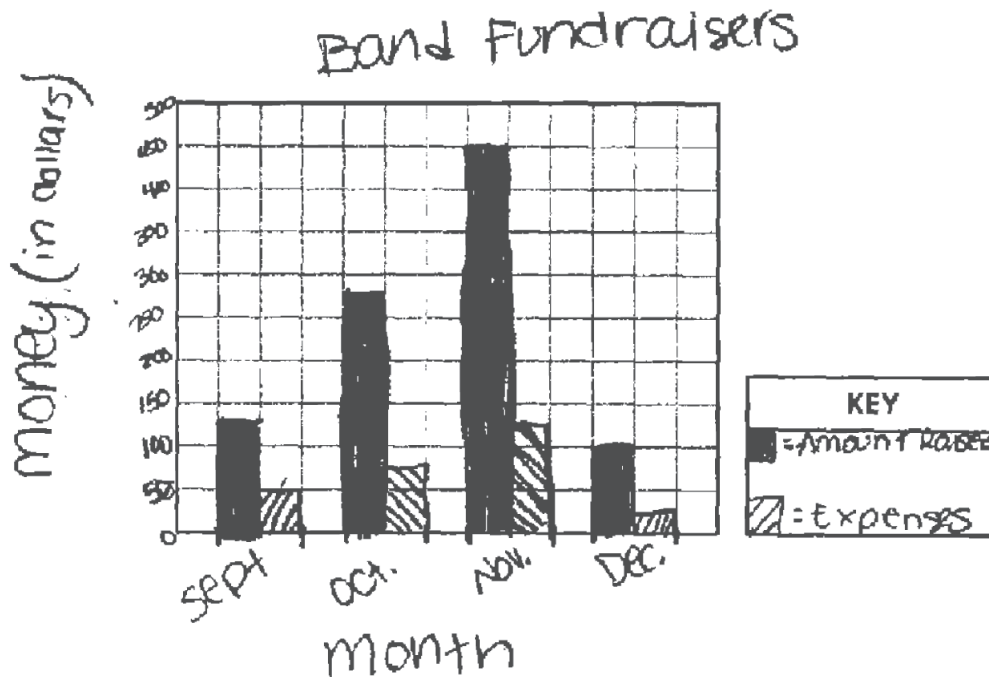
BAND FUNDRAISERS

Month	Amount raised	Expenses
September	\$125	\$50
October	\$275	\$75
November	\$450	\$125
December	\$100	\$25

Based on the data in the table, create a double-bar graph on the grid below to show the amount of money the band raises and the fundraising expenses for each month.

Be sure to

- title the graph
- label the axes
- provide an appropriate key for the graph
- graph all the data



This response demonstrates a thorough understanding of how to properly complete a double-bar graph.

Score Point - 3

34

The Roosevelt Middle School band has monthly fundraisers. The table below shows the amount of money the band raises and their fundraising expenses each month for four months.

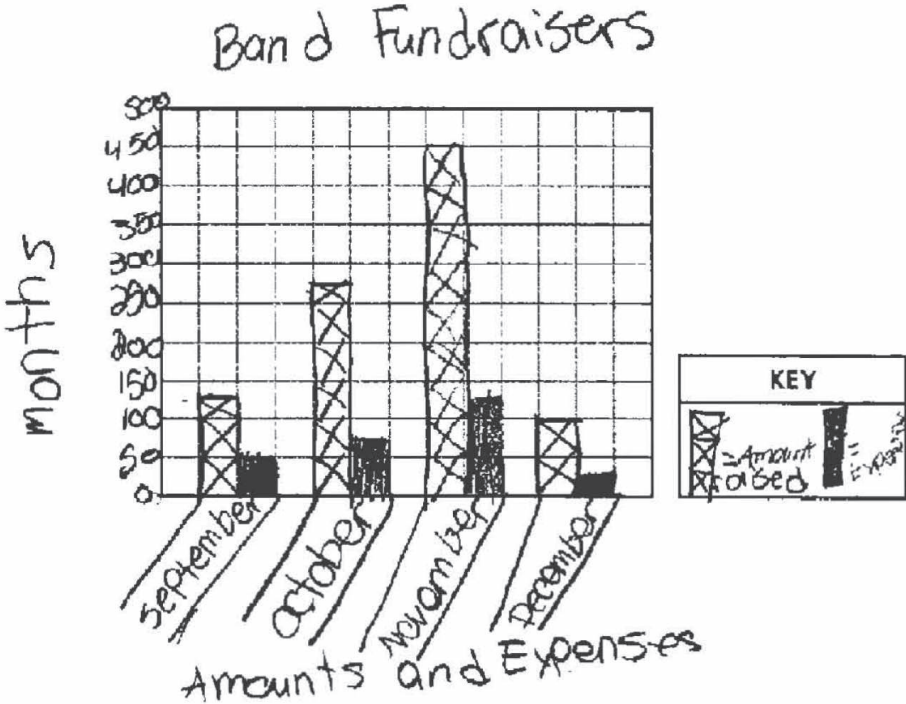
BAND FUNDRAISERS

Month	Amount raised	Expenses
September	\$125	\$50
October	\$275	\$75
November	\$450	\$125
December	\$100	\$25

Based on the data in the table, create a double-bar graph on the grid below to show the amount of money the band raises and the fundraising expenses for each month.

Be sure to

- title the graph
- label the axes
- provide an appropriate key for the graph
- graph all the data



This response demonstrates a partial understanding of the mathematical procedures embodied in the task. A correct key is provided, and most aspects of the double-bar graph are correct; however, "Months" and "Amounts and Expenses" are labeled on the wrong axes.

Score Point - 2

34

The Roosevelt Middle School band has monthly fundraisers. The table below shows the amount of money the band raises and their fundraising expenses each month for four months.

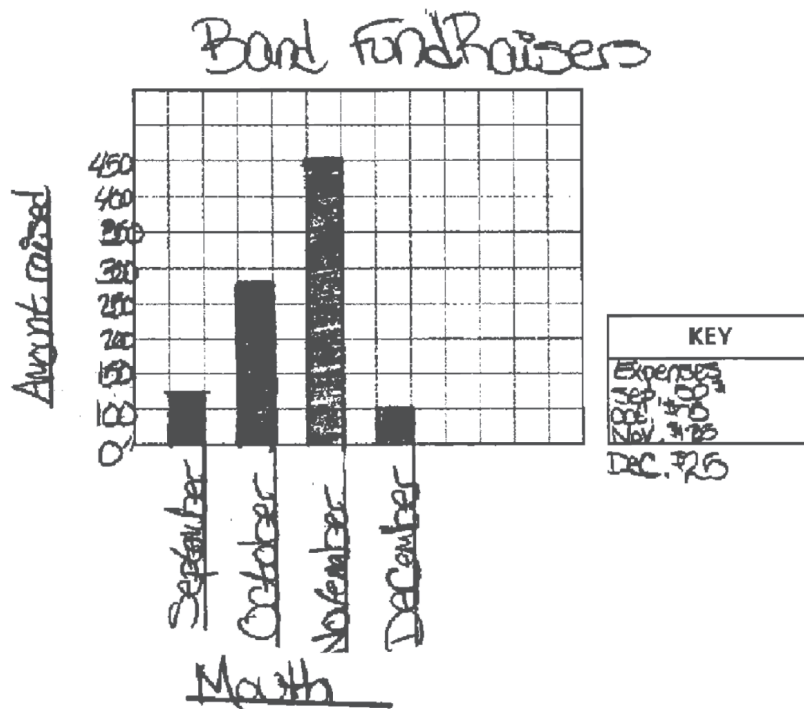
BAND FUNDRAISERS

Month	Amount raised	Expenses
September	\$125	\$50
October	\$275	\$75
November	\$450	\$125
December	\$100	\$25

Based on the data in the table, create a double-bar graph on the grid below to show the amount of money the band raises and the fundraising expenses for each month.

Be sure to

- title the graph
- label the axes
- provide an appropriate key for the graph
- graph all the data



This response exhibits many flaws but is not completely incorrect. Most of the labels on the graph are appropriate, and one bar of the graph is graphed correctly.

Score Point - 1

34

The Roosevelt Middle School band has monthly fundraisers. The table below shows the amount of money the band raises and their fundraising expenses each month for four months.

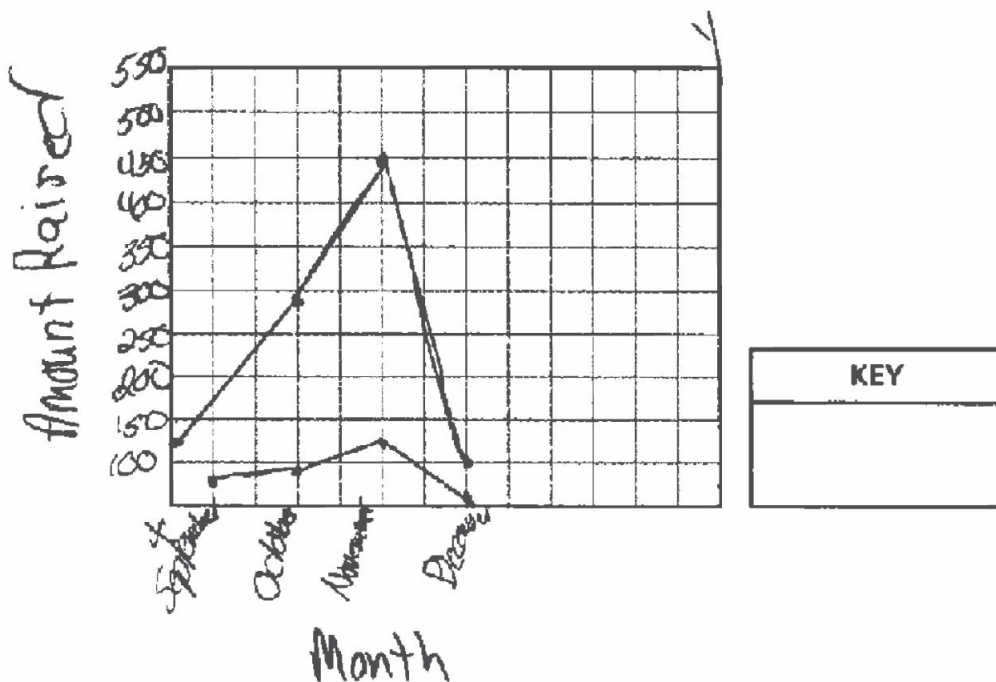
BAND FUNDRAISERS

Month	Amount raised	Expenses
September	\$125	\$50
October	\$275	\$75
November	\$450	\$125
December	\$100	\$25

Based on the data in the table, create a double-bar graph on the grid below to show the amount of money the band raises and the fundraising expenses for each month.

Be sure to

- title the graph
- label the axes
- provide an appropriate key for the graph
- graph all the data



This response is completely incorrect. The work shown is not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

Score Point - 0

35

Gilda's family goes on a vacation. They travel 125 miles in the first 2.5 hours. If Gilda's family continues to travel at this rate, how many miles will they travel in 6 hours?

$$\text{Distance} = \text{rate} \times \text{time}$$

Show your work.

Answer _____ miles

QUESTION 35

STRAND 2: ALGEBRA

Complete and Correct Response

- $d = r \times t$

$$r = \frac{d}{t}$$

$$r = 125 \text{ miles} \div 2.5 \text{ hours}$$

$$r = 50 \text{ miles per hour}$$

$$d = 50 \text{ miles per hour} \times 6 \text{ hours}$$

$$d = 300 \text{ miles}$$

OR other valid process

AND

- 300 miles

Score Points:

Apply 2-point holistic rubric

35

Gilda's family goes on a vacation. They travel 125 miles in the first 2.5 hours. If Gilda's family continues to travel at this rate, how many miles will they travel in 6 hours?

$$\text{Distance} = \text{rate} \times \text{time}$$

Show your work.

$$\begin{array}{r} 50 \\ 2.5 \overline{)1250} \\ \underline{-125} \\ 00 \\ \underline{-00} \\ 00 \end{array}$$

50 mi. in 1 hour

$$\begin{array}{r} 50 \text{ mi} \\ \times 6 \text{ hr} \\ \hline 300 \text{ mi} \end{array}$$

Answer 300 miles

This response is complete and correct. Adequate work is shown, resulting in the correct answer.

Score Point - 2

35

Gilda's family goes on a vacation. They travel 125 miles in the first 2.5 hours. If Gilda's family continues to travel at this rate, how many miles will they travel in 6 hours?

$$\text{Distance} = \text{rate} \times \text{time}$$

Show your work.

$$\frac{125 \text{ miles}}{2.5} = r \times \frac{2.5}{2.5}$$

$$125 \div 2.5 = 50$$

$$\begin{array}{r} 3.56 \\ \times 2.5 \\ \hline 6.0 \\ 17.8 \\ \hline 8.9 \end{array}$$

$$\begin{array}{r} 50 \\ \times 3.5 \\ \hline 175 \end{array}$$

Answer 175 miles

This response is only partially correct. A mathematically correct procedure is used to calculate the rate; however, the procedure used to find the total distance is flawed.

Score Point - 1

35

Gilda's family goes on a vacation. They travel 125 miles in the first 2.5 hours. If Gilda's family continues to travel at this rate, how many miles will they travel in 6 hours?

$$\text{Distance} = \text{rate} \times \text{time}$$

Show your work.

$$6 \div 2.5 = 2.4$$

$$d = \frac{r}{t}$$

$$125 \times 2.4 = 3,000$$

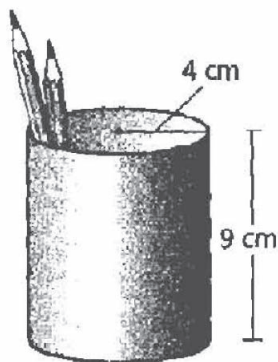
Answer 3,000 miles

This response is completely incorrect. The work shown is not sufficient to demonstrate even a partial understanding of the mathematical concepts embodied in the task.

Score Point - 0

36

Mary wants to cover the bottom and outside of a can with material to make a pencil holder. She needs to know the surface area of the outside of the can shown below.



[not drawn to scale]

Part A

Calculate the surface area, in square centimeters, of the outside of Mary's pencil holder using the formula $\pi r^2 + 2\pi rh$. Round your answer to the nearest tenth.

Show your work.

Answer _____ square centimeters

Part B

On the lines below, explain why the formula $\pi r^2 + 2\pi rh$ is used to find the surface area of Mary's pencil holder instead of $2\pi r^2 + 2\pi rh$.

QUESTION 36

STRAND 3: GEOMETRY

Complete and Correct Response:

Part A

- $\pi r^2 + 2\pi rh$
 $\pi \times 4^2 + 2\pi \times 4 \times 9$
 $16\pi + 72\pi$
 $88\pi = 276.4601535$

AND

- 276.5 square centimeters

Part B

- The surface area of only one circle is needed because she doesn't need to cover the top of the pencil holder with material.

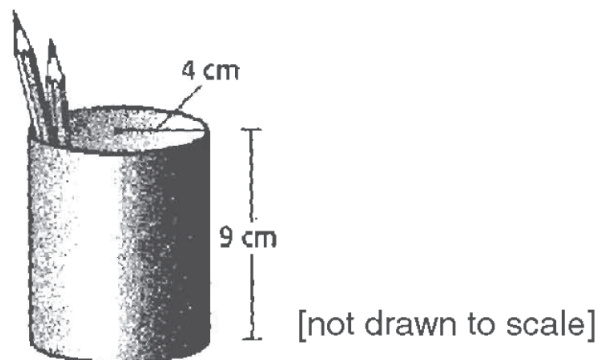
OR other valid explanation

Score Points:

Apply 3-point holistic rubric

36

Mary wants to cover the bottom and outside of a can with material to make a pencil holder. She needs to know the surface area of the outside of the can shown below.

**Part A**

Calculate the surface area, in square centimeters, of the outside of Mary's pencil holder using the formula $\pi r^2 + 2\pi rh$. Round your answer to the nearest tenth.

Show your work.

$$\begin{aligned}
 SA &= \pi r^2 + 2\pi rh \\
 SA &= \pi(4)^2 + 2\pi(4)(9) \\
 SA &= 50.26548246 + 226.194671 \\
 SA &= 50.26548246 + 226.194671 \\
 SA &= 276.4601535
 \end{aligned}$$

$$\begin{aligned}
 SA &= 50.26548246 + 226.194671 \\
 SA &= 276.4601535 \\
 SA &= 276.5
 \end{aligned}$$

Answer 276.5 square centimeters

Part B

On the lines below, explain why the formula $\pi r^2 + 2\pi rh$ is used to find the surface area of Mary's pencil holder instead of $2\pi r^2 + 2\pi rh$.

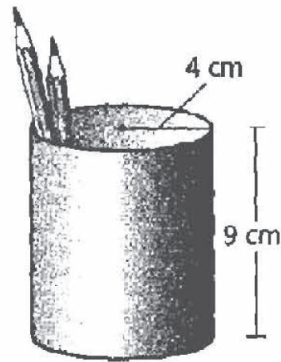
$\pi r^2 + 2\pi rh$ is used instead of $2\pi r^2 + 2\pi rh$ because Mary only wants to cover one hole. The one I used was for one hole, the other one is for both holes.

This response is complete and correct. The work shown demonstrates a thorough understanding of how to calculate surface area and round to the nearest tenth. The explanation provided in Part B is clear and complete.

Score Point - 3

36

Mary wants to cover the bottom and outside of a can with material to make a pencil holder. She needs to know the surface area of the outside of the can shown below.



[not drawn to scale]

Part A

Calculate the surface area, in square centimeters, of the outside of Mary's pencil holder using the formula $\pi r^2 + 2\pi rh$. Round your answer to the nearest tenth.

Show your work.

$$\begin{aligned} &\pi r^2 + 2\pi rh \\ &3.14 \cdot 4^2 + 6.28 \cdot 4 \cdot 9 \\ &50.24 + 226.08 \\ &= 276.32 \\ &\approx 276.3 \text{ cm}^2 \end{aligned}$$

Answer about 276.3 square centimeters

Part B

On the lines below, explain why the formula $\pi r^2 + 2\pi rh$ is used to find the surface area of Mary's pencil holder instead of $2\pi r^2 + 2\pi rh$.

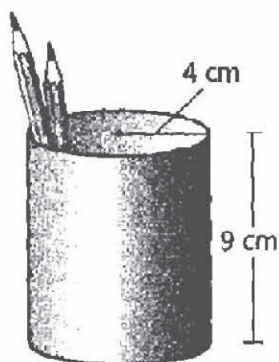
The formula $\pi r^2 + 2\pi rh$ is used instead
of $2\pi r^2 + 2\pi rh$ because it only has
one circular end with a measurement
instead of two.

This response addresses most aspects of the task, using mathematically sound procedures. An inappropriate value for pi is used. However, the remainder of the work shown is correct, and the explanation in Part B is clear and complete.

Score Point - 2

36

Mary wants to cover the bottom and outside of a can with material to make a pencil holder. She needs to know the surface area of the outside of the can shown below.



[not drawn to scale]

Part A

Calculate the surface area, in square centimeters, of the outside of Mary's pencil holder using the formula $\pi r^2 + 2\pi rh$. Round your answer to the nearest tenth.

Show your work.

$$\begin{array}{r} 2 \\ 3.14 \\ \hline 1884 \\ 3140 \\ \hline 5024 \end{array}$$

$$\begin{array}{r} 3.14 \\ \hline 6.28 \end{array}$$

$$\begin{array}{r} 226.08 \\ 50.24 \\ \hline 276.32 \\ 142 \\ 6.28 \\ \hline 36 \\ 137.68 \\ 18840 \\ \hline 22608 \end{array}$$

Answer 276.30 square centimeters

Part B

On the lines below, explain why the formula $\pi r^2 + 2\pi rh$ is used to find the surface area of Mary's pencil holder instead of $2\pi r^2 + 2\pi rh$.

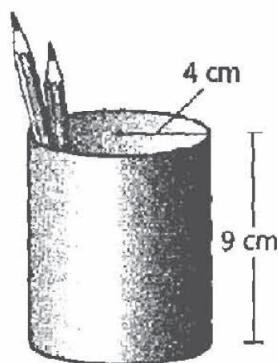
$\pi r^2 + 2\pi rh$ was used because
 $2\pi r^2 + 2\pi rh$ is used to
find volume.

This response demonstrates only a limited understanding of the mathematical concepts embodied in the task. The process of calculating the surface area is correct; however, an inappropriate value for pi is used. The explanation in Part B does not demonstrate an understanding of why the formula is used.

Score Point - 1

36

Mary wants to cover the bottom and outside of a can with material to make a pencil holder. She needs to know the surface area of the outside of the can shown below.



[not drawn to scale]

Part A

Calculate the surface area, in square centimeters, of the outside of Mary's pencil holder using the formula $\pi r^2 + 2\pi rh$. Round your answer to the nearest tenth.

Show your work.

Area = πr^2
Circumference $2\pi r$

$9 \times 4 + 2 + 2 = 17$

Answer 17 square centimeters

Part B

On the lines below, explain why the formula $\pi r^2 + 2\pi rh$ is used to find the surface area of Mary's pencil holder instead of $2\pi r^2 + 2\pi rh$.

The formula $\pi r^2 + 2\pi rh$ is used so they can add and get the number. Don't use $2\pi r^2 + 2\pi rh$ because it won't come out the same number.

This response is completely incorrect.

Score Point - 0

37

Dylan has a bag containing 15 marbles. The table below shows the number of marbles of each color in the bag. As part of a probability experiment for his science class, Dylan randomly picks a marble from the bag and then replaces it. He repeats this 300 times.

DYLAN'S BAG OF MARBLES

Marble Color	Number of Marbles
White	3
Red	8
Blue	3
Black	1

Part A

Dylan randomly picks a marble from the bag. What is the probability the marble will be red?

Answer _____

Part B

Predict the number of times out of 300 Dylan will pick a red marble.

Show your work.

Prediction _____ times

QUESTION 37

STRAND 5: STATISTICS AND PROBABILITY

Complete and Correct Response:

Part A

- $\frac{8}{15}$

OR other equivalent response

Part B

- $\frac{x}{300} = \frac{8}{15}$

$$x = \frac{2400}{15}$$

$$x = 160$$

OR other valid process

AND

- 160 times

Score Points:

Apply 2-point holistic rubric

37

Dylan has a bag containing 15 marbles. The table below shows the number of marbles of each color in the bag. As part of a probability experiment for his science class, Dylan randomly picks a marble from the bag and then replaces it. He repeats this 300 times.

DYLAN'S BAG OF MARBLES

Marble Color	Number of Marbles
White	3
Red	8
Blue	3
Black	1

Part A

Dylan randomly picks a marble from the bag. What is the probability the marble will be red?

Answer 8/15

$$\frac{8}{15}$$

Part B

Predict the number of times out of 300 Dylan will pick a red marble.

Show your work.

$$\begin{aligned} \frac{8}{15} &= \frac{n}{300} \\ 15 \cdot n &= 300 \cdot 8 \\ \frac{15n}{15} &= \frac{2400}{15} \\ n &= 160 \end{aligned}$$

Prediction 160 times

This response is complete and correct and demonstrates a thorough understanding of the mathematical concepts embodied in the task.

Score Point - 2

37

Dylan has a bag containing 15 marbles. The table below shows the number of marbles of each color in the bag. As part of a probability experiment for his science class, Dylan randomly picks a marble from the bag and then replaces it. He repeats this 300 times.

DYLAN'S BAG OF MARBLES

Marble Color	Number of Marbles
White	3
Red	8
Blue	3
Black	1

Part A

Dylan randomly picks a marble from the bag. What is the probability the marble will be red?

Answer $\frac{8}{15}$ chance

Part B

Predict the number of times out of 300 Dylan will pick a red marble.

Show your work.

Prediction $\frac{160}{300}$ times

$$\begin{array}{r} 15 \\ 20 \\ \hline 00 \\ 300 \end{array}$$

$$\begin{array}{r} 8 \\ 20 \\ \hline 160 \end{array}$$

This response is only partially correct. The answer in Part A is correct. In Part B, valid work to find 160 is shown; however, the final answer is incorrect.

Score Point - 1

37

Dylan has a bag containing 15 marbles. The table below shows the number of marbles of each color in the bag. As part of a probability experiment for his science class, Dylan randomly picks a marble from the bag and then replaces it. He repeats this 300 times.

DYLAN'S BAG OF MARBLES

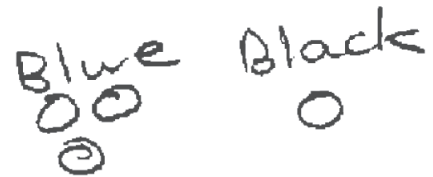
Marble Color	Number of Marbles
White	3
Red	8
Blue	3
Black	1



Part A

Dylan randomly picks a marble from the bag. What is the probability the marble will be red?

Answer red



Part B

Predict the number of times out of 300 Dylan will pick a red marble.

Show your work.

Prediction 150 times

This response is completely incorrect.

Score Point - 0

38

The Gatlins are buying new carpet for their house. They need about 1,175 square feet of carpet. The carpet they buy is sold by the square yard.

Part A

Estimate the number of square yards of carpet the Gatlins need for their house.

Show your work.

Answer _____ square yards

Part B

On the lines below, describe a strategy the Gatlins should use to correctly estimate the number of square yards of carpet they need for their house.

QUESTION 38

STRAND 1: NUMBER SENSE AND OPERATIONS

Complete and Correct Response:

Part A

- $1,175 \approx 1,200$
 $1,200 \div 10 \approx 120$ square yards

OR other valid process

AND

- Range of 110 to 135 yards

Part B

- Round the amount of square feet they need to carpet to 1,200 and divide by 10.
(1 square yard = 9 square feet, which is ≈ 10 square feet)

OR other valid strategy

Score Points:

Apply 3-point holistic rubric

38

The Gatlins are buying new carpet for their house. They need about 1,175 square feet of carpet. The carpet they buy is sold by the square yard.

Part A

Estimate the number of square yards of carpet the Gatlins need for their house.

Show your work.

$$1,175 \div 9$$

$$1200 \div 10 = 120$$

Answer 120 square yards

Part B

On the lines below, describe a strategy the Gatlins should use to correctly estimate the number of square yards of carpet they need for their house.

Round sq ft to nearest hundred
and divide by 10 (easier
to divide by 10 than 9) since
9 sq ft = 1 sq yd

This response is complete and correct. An appropriate estimation procedure is used correctly to convert square feet to square yards. The strategy provided in Part B is clear and complete.

Score Point - 3

38

The Gatlins are buying new carpet for their house. They need about 1,175 square feet of carpet. The carpet they buy is sold by the square yard.

Part A

Estimate the number of square yards of carpet the Gatlins need for their house.

Show your work.

$$\begin{array}{r}
 1175 \approx 1200 \\
 1 \text{ YD}^2 = 9 \text{ FT}^2 \\
 9 \overline{) 1200} \\
 \underline{9} \\
 30 \\
 \underline{27} \\
 30
 \end{array}$$

Answer 133. $\overline{33}$ square yards

Part B

On the lines below, describe a strategy the Gatlins should use to correctly estimate the number of square yards of carpet they need for their house.

You round first, then you divide to get your answer.

This response is partially correct. An appropriate estimation procedure is used to convert square feet to square yards; however, the description of the strategy is incomplete.

Score Point - 2

38

The Gatlins are buying new carpet for their house. They need about 1,175 square feet of carpet. The carpet they buy is sold by the square yard.

Part A

Estimate the number of square yards of carpet the Gatlins need for their house.

Show your work.

$9 \text{ ft}^2 = 1 \text{ yd}^2$

$$\begin{array}{r}
 130.55 \\
 \hline
 9 \overline{) 1175} \\
 \underline{9} \\
 27 \\
 \underline{27} \\
 05 \\
 \underline{09} \\
 50 \\
 \underline{45} \\
 55 \\
 \underline{54} \\
 5
 \end{array}$$

Answer 130.55 square yards

Part B

On the lines below, describe a strategy the Gatlins should use to correctly estimate the number of square yards of carpet they need for their house.

you convert square yards to square
feet and then divide

This response demonstrates only a limited understanding of the mathematical concepts embodied in the task. The procedure for converting square feet to square yards is correct, but no estimation procedure is present within the work shown or the description of the strategy.

Score Point - 1

38

The Gatlins are buying new carpet for their house. They need about 1,175 square feet of carpet. The carpet they buy is sold by the square yard.

Part A

Estimate the number of square yards of carpet the Gatlins need for their house.

Show your work.

$$12 \text{ yd.} = 1 \text{ ft.}$$

$$12^2 = 24$$

Answer 24 square yards

Part B

On the lines below, describe a strategy the Gatlins should use to correctly estimate the number of square yards of carpet they need for their house.

They'd have to figure out
how many yards are there in
1 foot. Then they'd have to
calculate square feet to
square yard.

This response is incorrect and does not demonstrate even a limited understanding of the mathematical concepts embodied in the task.

Score Point - 0



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