

SESSION 1

This session contains 33 multiple-choice questions. Fill in the circle for your answer to each multiple-choice question.

You may use a protractor and a ruler during this session. You may use a calculator during this session.

SAMPLE

Directions: Read each problem. Then fill in the circle of the best answer.

- 1** Find the value of the expression below.

$$\left(\frac{4^8}{4^{10}}\right)^3$$

- (A) 4^{54}
- (B) 4^6
- (C) $\frac{1}{4^5}$
- (D) $\frac{1}{4^6}$

- 2** Carlo made an x - y table of values that was a function. Which statement must be true of the table?

- (A) Each x -value corresponds to exactly one y -value.
- (B) Each y -value corresponds to the same x -value.
- (C) Each x -value corresponds to more than one y -value.
- (D) Each y -value corresponds to exactly one x -value.

- 3** Which table represents a nonlinear function?

(A)

| | | | | |
|----------|----|---|---|---|
| x | -2 | 0 | 2 | 4 |
| y | 3 | 2 | 3 | 6 |

(B)

| | | | | |
|----------|----|----|---|---|
| x | -2 | 0 | 2 | 4 |
| y | -4 | -2 | 0 | 2 |

(C)

| | | | | |
|----------|----|---|----|----|
| x | -2 | 0 | 2 | 4 |
| y | 5 | 1 | -3 | -7 |

(D)

| | | | | |
|----------|----|---|---|---|
| x | -2 | 0 | 2 | 4 |
| y | 2 | 4 | 6 | 8 |

SESSION 2

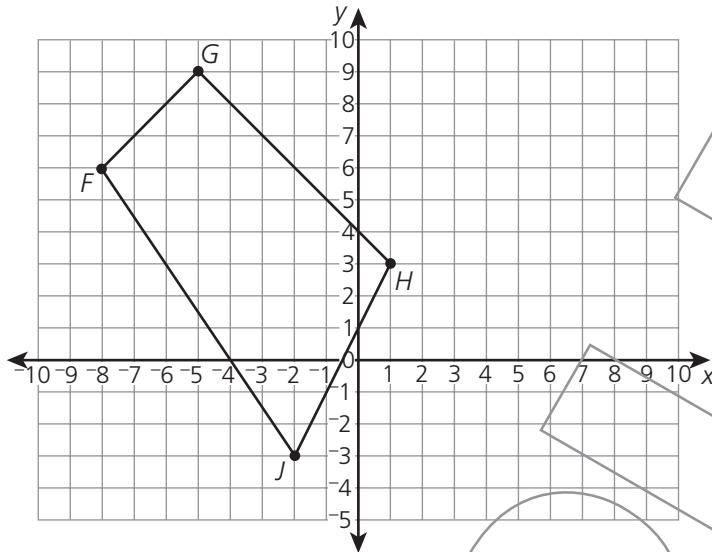
This session contains seven multiple-choice questions, seven short constructed-response items, and one extended constructed-response item. Fill in the circle for your answer to each multiple-choice question. Write your answers for the constructed-response items in the spaces provided.

You may use a protractor and a ruler during this session. You may use a calculator during this session.

SAMPLE

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What will be the coordinates of figure $F'G'H'J'$, the image of $FGHJ$ under a dilation of $\frac{2}{3}$ centered at point H ?



- (A) $F'(-5, 5)$, $G'(-3, 7)$, $H'(\frac{1}{3}, 1)$, $J'(-1, -1)$
- (B) $F'(-5, 5)$, $G'(-3, 7)$, $H'(1, 3)$, $J'(-1, -1)$
- (C) $F'(-5\frac{1}{3}, 4)$, $G'(-3\frac{1}{3}, 6)$, $H'(1, 3)$, $J'(-1\frac{1}{3}, -1)$
- (D) $F'(-5\frac{1}{3}, 4)$, $G'(-3\frac{1}{3}, 6)$, $H'(\frac{1}{3}, 1)$, $J'(-1\frac{1}{3}, -1)$

39

Which of the following describes the solution to the equation below?

$$8(x + \frac{14}{16}) = 8x + 7$$

- (A) infinitely many solutions
- (B) $x = \frac{49}{8}$
- (C) $x = 7$
- (D) no solution

46

A scientist is studying several types of bacteria, as shown in the table below.

| Bacteria | Length (mm) |
|----------|-----------------------|
| A | 2.5×10^{-3} |
| B | 7×10^{-3} |
| C | 1.01×10^{-2} |
| D | 4.8×10^{-3} |

Part A: About how many times longer is bacteria C than bacteria A?
Give your answer to the nearest whole number.

Answer: _____

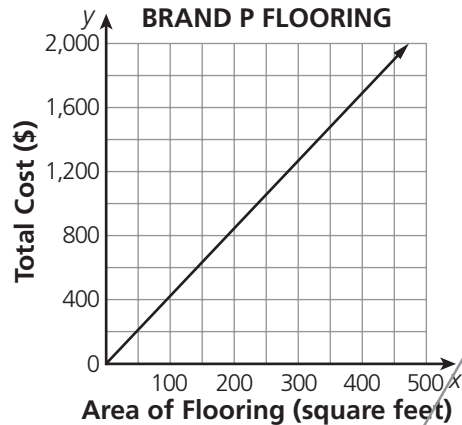
Part B: What is the total length of one of each of these bacteria cells?

Show your work.

Answer: _____ millimeter

48

This graph models the relationship between the square feet of Brand P flooring and its total cost.



Part A: What is the cost per square foot of the Brand P flooring?

Answer: \$ _____ per square foot

This table models the relationship between the square feet of Brand Q flooring and its total cost.

| Area of Flooring (square feet) | Total Cost (\$) |
|--------------------------------|-----------------|
| 50 | 175 |
| 150 | 525 |
| 250 | 875 |
| 350 | 1,225 |

Part B: What is the total cost for 400 square feet of Brand Q flooring?

Answer: \$ _____

Mrs. Williams plans to buy either Brand P or Brand Q flooring for her home.

Part C: Explain whether Brand P or Brand Q has the better price.
