Name: _____

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Released Practice Form
Grade 6
Mathematics

**Missouri Department of Elementary
and Secondary Education**
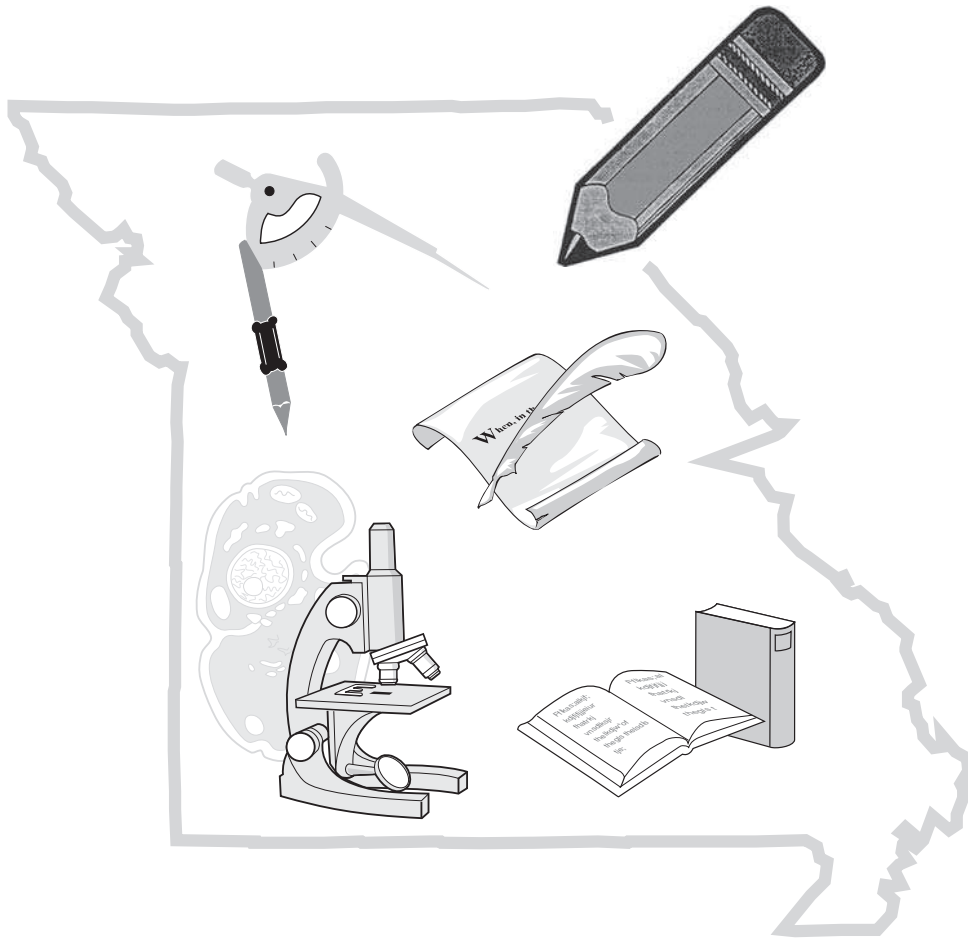
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Please use ONLY a Number 2 pencil for this session.

Session 1

Mathematics

1. A zoo has male and female bats. The zoo always keeps the same ratio of male to female bats in their main display. The table shows the numbers of male and female bats in the zoo's main display at various times.

Bats in Main Display

Males	Females
3	4
6	8
9	12

Plot the three pairs of values from the table on the coordinate grid.

Bats in Main Display
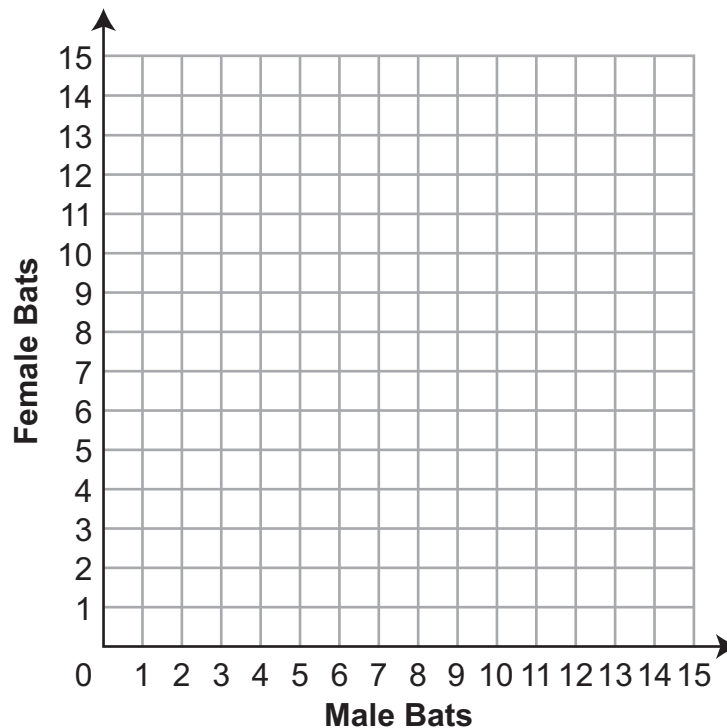
2. Select the **two** numbers equivalent to 0.042.

   A. 0.42%

   B. 4.2%

   C. 42%

   D. $\dfrac{42}{1000}$

   E. $\dfrac{42}{100}$

Go on to the next page.

3. A charity needs more than 15 volunteers to help run a fundraising event. Which inequality could be used to represent the number of volunteers, v, needed for the event?

   A. $v < 15$

   B. $v \leq 15$

   C. $v > 15$

   D. $v \geq 15$

4. An expression is shown.

   $60 + 84$

   The expression is rewritten as $6(x + y)$. What is the value of $x + y$?

   A. 10

   B. 24

   C. 74

   D. 94

5. Carson's favorite band is playing 5 concerts. The ticket prices, in dollars, for each of the 5 concerts are listed below.

   $$14, 14, 16, 20, 21$$

   What is the mean absolute deviation of the ticket prices for the 5 concerts?

6. What is the distance, in units, between the points (2, 3) and (2, ⁻6) on a coordinate plane?

   A. 3

   B. 5

   C. 9

   D. 11

Go on to the next page.

7. Plot a point to show the location of $^-1\frac{3}{4}$ on the number line.
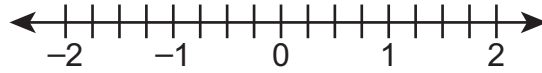
8. Select the **three** equations.

    A. $2x + 1$

    B. $x = 7$

    C. $3x - 5$

    D. $\dfrac{7x}{15}$

    E. $10x = 2$

    F. $5 = 3 - 2x$

9. The ratio of people to books in a classroom is 10:4. What is the unit rate of people per book?

    A. 0.4

    B. 0.6

    C. 2.5

    D. 5.2

10. Which graph represents the solution set for the inequality $x \geq 9$?

    A.

    B.

    C.

    D.
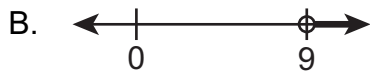
11. The point (⁻2, 4) is plotted on the coordinate plane.
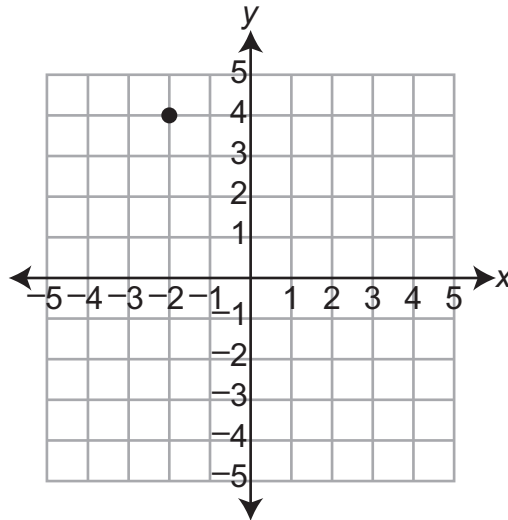
The point is reflected across the *y*-axis. What are the coordinates of the reflected point?

A. (⁻2, ⁻4)

B. (⁻2, 4)

C. (2, ⁻4)

D. (2, 4)

12. Which number is equivalent to $\frac{7}{12} \div \frac{8}{3}$?

A. $\frac{7}{32}$

B. $\frac{9}{14}$

C. $\frac{14}{9}$

D. $\frac{32}{7}$

Go on to the next page.

13. The length of a certain rectangle is 5 units more than the width. Write an equation that represents the length, *l*, in terms of the width, *w*, for this rectangle.

14. Four teams participate in a chess tournament each year. Each team consists of one adult and one child. Each team records the difference in the number of wins by the adult and by the child from last year to this year, as shown in the table.

Team	Adult Difference in Wins Between Years	Child Difference in Wins Between Years
Team A	$^-1$	1
Team B	1	1
Team C	1	$^-2$
Team D	$^-1$	$^-2$

Each team creates an ordered pair to show the total change in the number of wins from last year to this year.

- The *x*-coordinate of the ordered pair represents the change in the number of wins for the adult on the team.

- The *y*-coordinate of the ordered pair represents the change in the number of wins for the child on the team.

Each team's ordered pair ends up in one of the four quadrants. Write the name of each team under the quadrant that has that team's ordered pair.

Quadrant I	Quadrant II	Quadrant III	Quadrant IV

Go on to the next page.

15. An electrician has 42.3 meters of wire to use on a job. On the first day, she uses 14.742 meters of the wire. How many meters of wire does she have remaining after the first day?

   A. 27.442

   B. 27.558

   C. 27.642

   D. 27.658

16. Laura uses the inequality $\frac{1}{2}x - 7 > 10$ to determine the number of pillows, x, she needs to sell at the craft fair to make a profit. What is the **least** number of pillows Laura needs to sell to earn a profit?

   A. 33

   B. 34

   C. 35

   D. 36

17. Each of the pairs of values in the table has the same ratio.

x	14	21	28
y	4		8

   What is the missing value in the table?

18. Scott earns $15 for each birdhouse that he sells. He uses the expression 15x to calculate his earnings, in dollars. What is the meaning of the variable x in Scott's expression?

   A. the number of birdhouses he sells

   B. the total amount of money he earns

   C. the amount of money he earns per birdhouse

   D. the number of hours it takes to make each birdhouse

Go on to the next page.

19. A soccer team gained 3 new players after 7 players left the team. Which expression describes the change in the number of players on the team?

    A. $(^-7) + 3$

    B. $7 + 3$

    C. $^-7 - 3$

    D. $7 + (^-3)$

20. A hardware store sold h hammers in February. The hardware store sold 5 less than 2 times as many hammers in June as it did in February. Write an expression the hardware store could use to represent the number of hammers it sold in June.

21. Benny and Kiara each sell comic books.

    - Benny sells 8 comic books for $6.00.
    - Kiara sells 10 comic books for $7.00.

    Which statement correctly explains who sells comic books at a lower unit rate?

    A. Benny sells comic books at a lower unit rate because $6.00 is less than $7.00.

    B. Benny sells comic books at a lower unit rate because $8 ÷ 6 = 1.33$ is less than $10 ÷ 7 = 1.43$.

    C. Kiara sells comic books at a lower rate because Benny's 8 comic books would sell for less than $6.00 if he sold them at the same rate as Kiara.

    D. Kiara sells comic books at a lower rate because the difference between the price for which Kiara sells 10 comic books and the price for which Benny sells 8 comic books is less than $2.00.

Go on to the next page.

22. An expression is shown below.

    4(6 + 3) + 4

    Select the **two** expressions that are equivalent to the given expression.

    A. 4(6 + 3 + 1)

    B. 4(6 + 3 + 4)

    C. 12(2 + 1) + 4

    D. 12(2 + 3) + 4

    E. 24 + 3(2)

    F. 24 + 3 + 4

23. Emily runs a lawn-mowing business. She records the number of lawns her business mows each day for 10 days. Her data are shown.

    7, 12, 9, 9, 8, 9, 11, 11, 12, 9

    Create a dot plot to represent Emily's data.

    Emily's Data
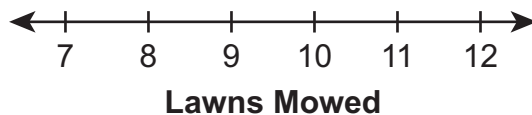
    ```
    ◄──┼────┼────┼────┼────┼────┼──►
       7    8    9   10   11   12
    ```
    Lawns Mowed

STOP.

ATTENTION!

Do NOT go on

until you are

told to do so.

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| Please use ONLY a Number 2 pencil for this session. |

Session 2

Mathematics

Directions Now you will be taking Session 2 of the Mathematics Practice Form. This session includes different types of questions. Some questions will have answer choices that begin with letters. Circle the letter of each correct answer. Other questions will ask you to circle, write, or show your answers. Read each question carefully and follow the directions. Mark all your answers in your test booklet. Calculators are allowed in this session.

1. A rectangular prism is shown.

3 centimeters

14 millimeters
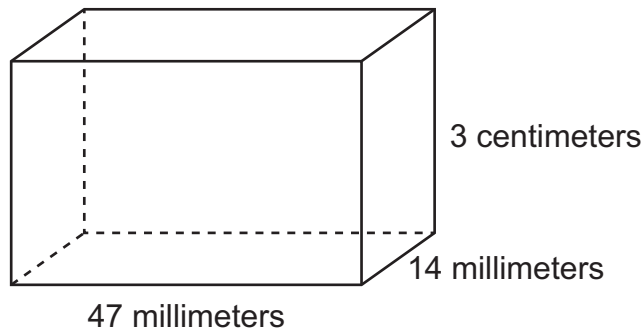
47 millimeters

What is the volume, in cubic **millimeters**, of the rectangular prism?

2. Dominic works at a supermarket. He weighs some cheese, in pounds, for a customer. Then, he removes some of the cheese from the scale and weighs the remaining cheese. The equation below represents this situation.

$$1.65 - x = 1.50$$

What is the value of x, and what does it most likely represent?

A. The value of x is 0.15, and it represents the amount of cheese, in pounds, Dominic removes from the scale.

B. The value of x is 0.15, and it represents the amount of cheese, in pounds, that the customer purchases from Dominic.

C. The value of x is 3.15, and it represents the amount of cheese, in pounds, Dominic removes from the scale.

D. The value of x is 3.15, and it represents the amount of cheese, in pounds, that the customer purchases from Dominic.

3. Ashley needs a piece of wire that is 12.5 feet long for a project. What is the length, in **meters**, of the piece of wire Ashley needs for her project?

    (1 inch = 2.54 centimeters)

Go on to the next page.

4. An expression is shown.

    $6(2 + 3)^2 - 1$

    What is the value of the expression?

    A. 20
    B. 59
    C. 149
    D. 899

5. There are 12 fifth-grade students and 18 sixth-grade students in a mixed-grade class. What is the ratio of fifth-grade students to **all** the students in the class?

    A. 2:3
    B. 2:5
    C. 3:2
    D. 5:2

6. Jason buys 2 sandwiches for $12. He uses the equation shown to find the cost, x, of each sandwich.

    $$2x = 12$$

    What is the cost of each sandwich?

    A. $6
    B. $10
    C. $14
   D. $24

Go on to the next page.

7. Select the **three** statistical questions.

    A. What is your age?

    B. What time does school start?

    C. How many pets does your friend have?

    D. How many siblings does each student in your class have?

    E. What is the eye color of each person in your after-school club?

    F. How many servings of fruit does each person in your school eat at lunch?

8. There were 12 people on a bus. At the first stop, 4 people got off the bus and 6 people got on the bus. Which expression could be used to find the number of people on the bus after the first stop?

    A. $12 + (^-6) + 4$

    B. $12 + (^-6) + (^-4)$

    C. $12 + 6 + 4$

    D. $12 + 6 + (^-4)$

9. The table shows the relationship between two variables, x and y. The same rule is used to create each row in the table.

x	y
1	3
2	11
3	19
4	27

Which statement about the table is true?

    A. As the x-values increase, the difference between consecutive y-values increases.

    B. As the x-values increase, the difference between consecutive y-values decreases.

    C. As the x-values increase, the difference between the y-value and x-value in each row increases.

    D. As the x-values increase, the difference between the y-value and x-value in each row decreases.

Go on to the next page.

10. The dimensions of Dawn's porch are shown.
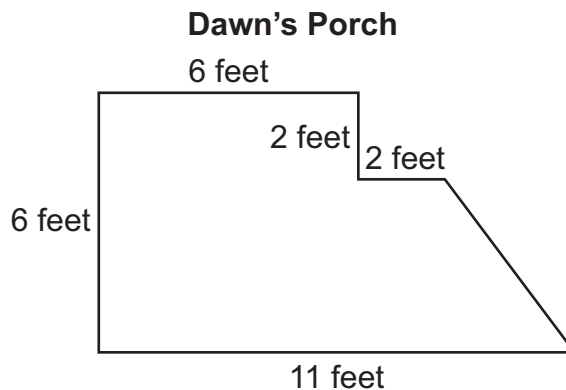
Dawn's Porch

What is the area, in square feet, of Dawn's porch?

A. 32

B. 42

C. 46

D. 50

11. Danny cuts blocks of wood from a log. Each block of wood is a square prism. Danny writes the expression $2x^2 + 4xy$ to represent the surface area of each block of wood. In Danny's expression,

- x represents the length, in inches, of the base of the block of wood, and
- y represents the height, in inches, of the block of wood.

Match each length and height pair with the corresponding surface area for a block of wood with those measurements. Draw a line to make a match.

length: 1.5 inches; height: 5.75 inches		28.875 square inches
length: 1.75 inches; height: 3.75 inches		32.375 square inches
length: 2.75 inches; height: 1.25 inches		39 square inches

Go on to the next page.

12. Of the 40 students in Ms. Carr's class, 87.5% live less than 10 miles from school. How many of the students in Ms. Carr's class live less than 10 miles from school?

13. Each student in Anthony's grade writes a book report. Anthony surveys some of the students about the length, in pages, of their book reports. He makes the table to show his results.
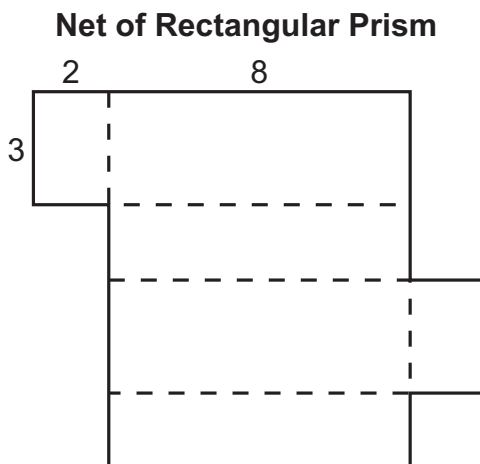
Book Report Survey Results

Pages in Book Report	Number of Students
3	2
4	12
5	19
6	6
7	1

How many students did Anthony survey?

A. 15

B. 25

C. 40

D. 65

Go on to the next page.

14. The net of a rectangular prism is shown.

Net of Rectangular Prism

What is the surface area, in square units, of the rectangular prism?

A. 44

B. 48

C. 60

D. 92

15. An expression is shown.

$4 - 3x^2 + 5x$

Select the **two** statements about the expression that are true.

A. The expression has six terms.

B. The 5 is an exponent in a term.

C. One of the terms is a constant.

D. The x is a variable in two terms.

E. The coefficient of one of the terms is 2.

16. Jesse's new pool holds 1,624 gallons of water. He can fill the pool at a rate of 112 gallons per hour. How many hours will it take Jesse to fill his pool?
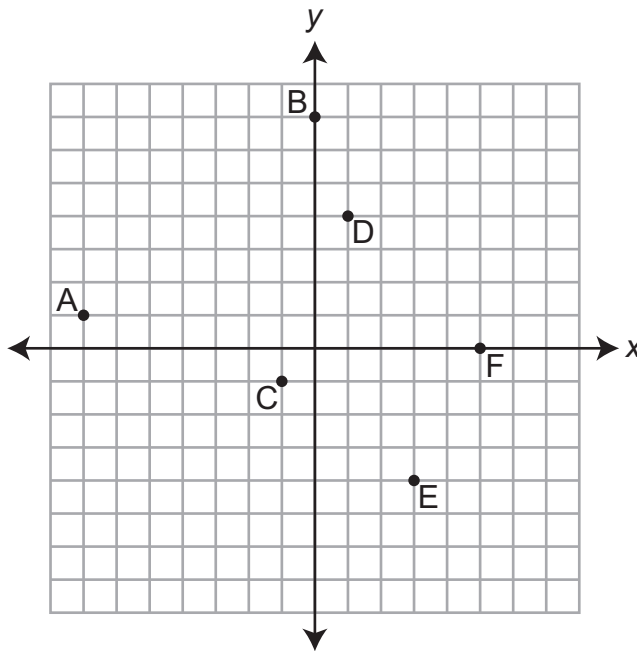
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17. Points A, B, C, and D are plotted on the number line.
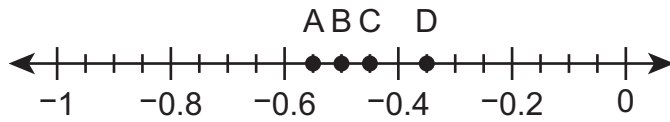
Which point is plotted at ⁻0.45?

A. A

B. B

C. C

D. D

18. Points A through F are shown on the coordinate plane.

Select the **two** points that have a negative *y*-coordinate.

A. point A

B. point B

C. point C

D. point D

E. point E

F. point F

Go on to the next page.

19. Each of the pairs of values in the table has the same ratio.

x	6	14	k	28
y	9	m	30	42

What are the values of k and m?

A. $k = 16$ and $m = 28$

B. $k = 20$ and $m = 21$

C. $k = 22$ and $m = 18$

D. $k = 27$ and $m = 17$

20. Clark measured the widths, rounded to the nearest half inch, of 21 different windows in his school. He is creating a histogram to display his results. He knows the following pieces of information:

   • There is at least 1 window in each interval.
   • The median width is 22 inches.

Complete Clark's histogram by adding the missing data.

Widths of School Windows
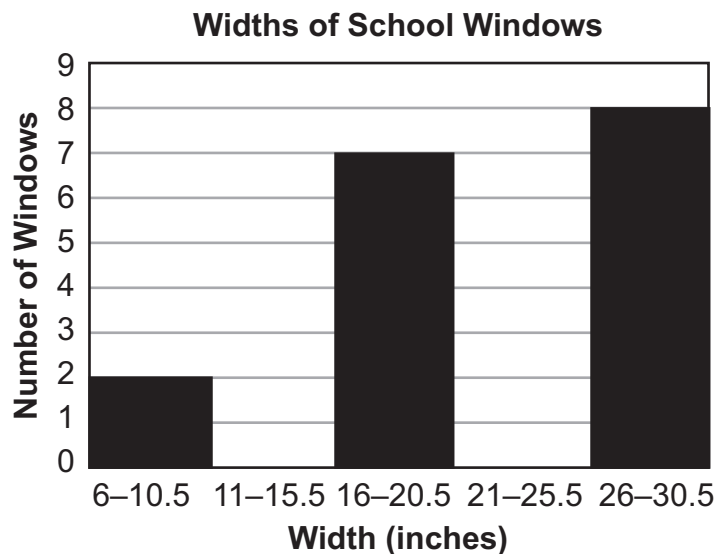
21. What is the solution set for the inequality $54 < 18x$?

A. $x > 3$

B. $x < 3$

C. $x > 36$

D. $x < 36$

Go on to the next page.

22. Jackson and Lamont each write down the date they were born. (For example, a person born on September 17 would write down "17.") They notice the following things about the two different numbers.

    - Both dates have 24 as a multiple.
    - The larger date is **not** a multiple of the smaller date.
    - The greatest common factor of the two dates is 4.

    What is the larger of the two dates?

23. Which expression has the greatest value?

    A. $|{}^-10|$

    B. $|{}^-3|$

    C. $|6|$

    D. $|9|$

STOP.

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told to do so.

Session 3

Mathematics

Directions Now you will be taking Session 3 of the Mathematics Practice Form. This session includes a Performance Event that contains a set of questions based on a common task or scenario. Some questions will have answer choices that begin with letters. Circle the letter of each correct answer. Other questions will ask you to circle, write, or show your answers. Read each question carefully and follow the directions. Mark all your answers in your test booklet. Calculators are allowed in this session.

Five students participate in a fund-raiser, earning money for each mile they ride on bicycles. The table shows the amount of money three of the students earn for each mile they ride.

Money Earned per Mile

Student	Money Earned per Mile
Jason	$12.95
Kimberly	$14.05
Luis	$12.75
Marta	?
Nicky	?

Each student in the fund-raiser rides a whole number of miles. The list shows the five students in order from least to greatest based on the number of miles they ride. No two students rode the same number of miles.

Student List

Kimberly, Nicky, Marta, Luis, Jason

1. Kimberly rides x miles in the fund-raiser. Jason rides $2(x + 3) + 4$ miles in the fund-raiser. Which expression also represents the number of miles Jason rides in the fund-raiser?

   A. $x + 9$

   B. $x + 10$

   C. $2x + 10$

   D. $2x + 14$

2. Kimberly rides x miles in the fund-raiser. Jason rides $2(x + 3) + 4$ miles in the fund-raiser. Write each part of Jason's expression in the column or columns that describe each part. The parts of the expression are shown below the table.

Coefficient	Constant	Sum	Term	Product	Variable

   2

   2(x + 3)

   4

   x

   (x + 3)

Go on to the next page.

3. Use the **Money Earned Per Mile** table to answer the question.

    Jason rides 40 miles. He works through the steps shown to calculate the amount of money he earns.

    • Step 1: First, I rounded $12.95 to the nearest dollar, which is $13.
    • Step 2: Then, I multiplied 4 × 13, which is 52.
    • Step 3: Then, I multiplied 10 × 52, which is 520.
    • Step 4: Then, since there are 20 nickels in $1, I know there are 40 nickels in $2.
    • Step 5: Finally, I subtracted $2 from $520 to get $518.

    Explain why Jason determined the number of nickels in $2 in Step 4 to help him calculate the total amount of money he earns.

4. Nicky rides 22 miles and earns $308. He uses the equation $22x = 308$ to determine the amount of money earned per mile. How much money does Nicky earn in dollars per mile?

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│          │
│          │
└──────────┘
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5. Use the **Money Earned per Mile** table to answer the question.

Luis wants to find the total amount of money the 5 students earn.

-   First he finds the total number of miles all 5 students ride.
-   Then, he finds the average of the 5 values of money earned per mile in the second column of the completed table.
-   Finally, he multiplies the total number of miles by the average of the money earned per mile.

Which statement **best** explains whether Luis's method is correct?

A. Luis's method is correct because the money earned is the product of the number of miles and the money earned per mile.

B. Luis's method is correct because it is the same as 1 rider riding all the miles and earning an average amount of money per mile.

C. Luis's method is incorrect because he should multiply the average number of miles by the average of the 5 values in the completed table.

D. Luis's method is incorrect because none of the 5 students ride the same number of miles but his average of the 5 values in the completed table treats them as if they all do.

Go on to the next page.

6. Use the **Money Earned per Mile** table and the **Student List** to answer the question.

    Luis earns between $300 and $310. Nicky rode 22 miles. Marta earns $391. How much money does Marta earn per mile? Explain how you determined your answer.

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