2023 MATHLETES CHALLENGE

CHAMPIONSHIP

TEST 2

2023 Mathletes Challenge Championship

Test 2 - You will have 20 minutes to complete this 20 question test. Good luck!

* Required

What is your team name? Example: Terry Team 2 *

Championship Test - 2 of 2

Question 1 * 1 point

Mandy is walking in the woods. She completes 70% of her walk in $3\frac{1}{2}$ hours. She continues walking at that same rate. How much time, in hours, will Mandy's entire walk take?

A. $3\frac{4}{5}$

B. 5

C. 6

D. $6\frac{1}{2}$

Mark only one oval.

- ◯ A
- ◯ B
- ◯ C
- ◯ D

Question 2 *

1 point

The table below shows the relationship between the amount of electricity used by a customer in different months and the cost shown on the customer's electric bill.

Monthly Electric Bills for a Customer

Month	Amount of Electricity Used (kilowatt-hours)	Cost of Electricity Used ($)
1	290	27.55
2	350	33.25
3	460	43.70
4	500	47.50

Based on the information shown in the table, which inequality could be used to determine all the numbers of kilowatt-hours (x) of electricity a customer could use in a month for the cost to be less than $65.00?

A. $0.095x < 65.00$

B. $0.095x > 65.00$

C. $0.92x < 65.00$

D. $0.92x > 65.00$

Mark only one oval.

- A
- B
- C
- D

Question 3 *

1 point

The table below shows the numbers of pages Lenny can read in certain amounts of time.

Lenny's Reading Rate

Time (minutes)	Pages Read
60	108
90	162
135	243

Based on the table, which equation can be used to determine the number of pages (p) Lenny can read in t minutes?

A. $p = 1.5t$

B. $p = 1.8t$

C. $t = 1.5p$

D. $t = 1.8p$

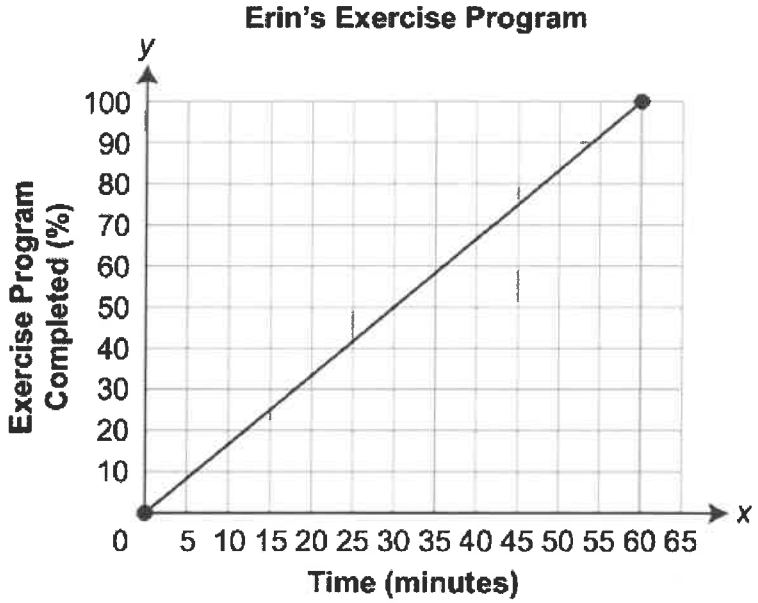
Mark only one oval.

- A
- B
- C
- D

Question 4 *

1 point

Erin completes an exercise program at a fitness center. The graph shown below represents the percentage of her exercise program (y) Erin has completed when she has exercised for x minutes.



Based on the graph, what does the value of the y-coordinate represent when $x = 15$?

A. Erin has completed 9% of her exercise program.

B. Erin has completed 25% of her exercise program.

C. Erin has completed 9 minutes of her exercise program.

D. Erin has completed 25 minutes of her exercise program.

Mark only one oval.

- A
- B
- C
- D

Question 5 *

1 point

A stone with a triangular face is used in a water fountain. Lennox made a scale drawing of the triangular face. He labels the vertices of his triangle as P, Q, and R. The sides of triangle PQR are described below.

- Side PQ is 12 inches long.
- Side QR is 25% longer than side PQ.
- Side PR is $\frac{2}{3}$ the length of side QR.

Each inch of Lennox's scale drawing represents $\frac{1}{2}$ foot of the actual triangular face. What is the perimeter, in feet, of the actual triangular face of the stone?

A. $8\frac{1}{2}$

B. $18\frac{1}{2}$

C. 34

D. 74

Mark only one oval.

- ◯ A
- ◯ B
- ◯ C
- ◯ D

Question 6 *

1 point

Which expression is equivalent to 24(807)?

A. 20(8) + 4(8) + 20(7) + 4(7)

B. 20(80) + 4(80) + 20(7) + 4(7)

C. 20(800) + 4(800) + 20(7) + 4(7)

D. 20(800) + 4(800) + 20(70) + 4(70)

Mark only one oval.

- A
- B
- C
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Question 7 *

1 point

A square pyramid is cut into two pieces with a single straight cut. The cut passes through the vertex of the pyramid and is perpendicular to the base. What shape is created by the cross section of the cut?

A. an isosceles triangle
B. a rectangle that is not a square
C. a scalene right triangle
D. a square

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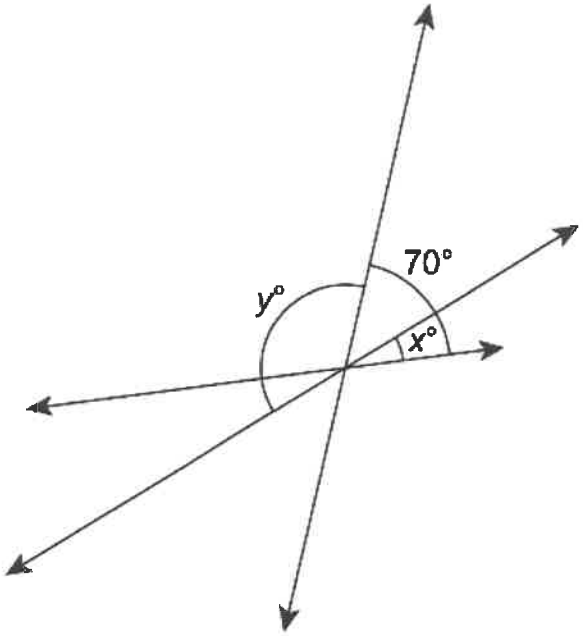
Question 8 * 1 point

The figure below shows three intersecting lines.



Which statement **best** describes all the possible measures for the angle labeled $y°$?

A. The measure of the angle is $x°$, and it is between 0° and 70°.
B. The measure of the angle is $x°$, and it is between 110° and 180°.
C. The measure of the angle is $110° + x°$, and it is between 0° and 70°.
D. The measure of the angle is $110° + x°$, and it is between 110° and 180°.

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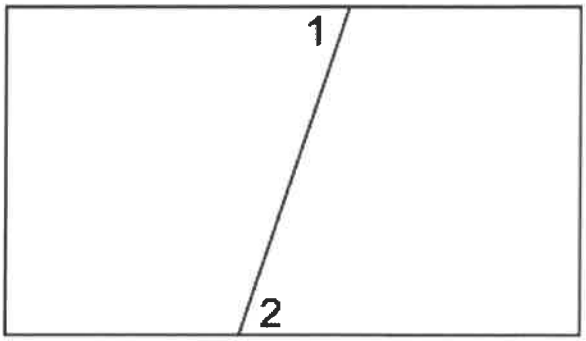
Question 9 * 1 point

A rectangle is shown below.



Which term describes the relationship between angle 1 and angle 2?

A. alternate exterior angles

B. corresponding angles

C. alternate interior angles

D. vertical angles

Mark only one oval.

- A
- B
- C
- D

Question 10 *

1 point

. A town has a population of 7,500. The mayor asked two different employees to conduct a survey to determine whether residents of the town are in favor of the construction of a new baseball stadium.

- Denise surveyed 150 randomly selected residents at a recent baseball game.
- Tamira surveyed 150 randomly selected residents living in different sections of town.

The table below shows the results of the two surveys.

New Baseball Stadium

	In Favor	Opposed	No Opinion
Denise's Survey	125	20	5
Tamira's Survey	30	105	15

Which statement identifies the more reliable survey and provides a valid conclusion based on that survey?

A. Denise's survey is more reliable than Tamira's survey, and approximately 6,250 residents of the town would likely be in favor of the construction of a new baseball stadium.

B. Denise's survey is more reliable than Tamira's survey, and approximately 1,250 residents of the town would likely be opposed to the construction of a new baseball stadium.

C. Tamira's survey is more reliable than Denise's survey, and approximately 1,500 residents of the town would likely be in favor of the construction of a new baseball stadium.

D. Tamira's survey is more reliable than Denise's survey, and approximately 6,000 residents of the town would likely be opposed to the construction of a new baseball stadium.

Mark only one oval.

- ◯ A
- ◯ B
- ◯ C
- ◯ D

Question 11 *

1 point

Mr. Eliaz randomly selects a student from his algebra class each day. Each student is equally likely to be selected. There is an equal number of male and female students in his class. On Monday, Tuesday, Wednesday, and Thursday of this week, the randomly selected student is a male student. Which statement **best** describes the probability Mr. Eliaz selects a male student on Friday?

A. The probability Mr. Eliaz selects a male student on Friday is the same as it was on each of the other days.

B. The probability Mr. Eliaz selects a male student on Friday is less than it was on other days because he has already selected a male student 4 days in a row.

C. The probability Mr. Eliaz selects a male student on Friday is greater than it was on other days because he has already selected a male student 4 days in a row.

D. The probability Mr. Eliaz selects a male student on Friday is impossible to determine without knowing how many students are in his class.

Mark only one oval.

- ◯ A
- ◯ B
- ◯ C
- ◯ D

Question 12 *

1 point

. A nursery sells tulip plants. Each plant has 1 tulip. The tulips come in 4 different colors. The tulip plants available at the nursery are listed below.

- 22 plants with a red tulip
- 30 plants with a pink tulip
- 28 plants with a yellow tulip
- 20 plants with a white tulip

Amy purchases one tulip plant at random. What is the probability that Amy's tulip plant has a tulip that is **not** pink?

A. $\frac{1}{4}$

B. $\frac{3}{10}$

C. $\frac{7}{10}$

D. $\frac{3}{4}$

Mark only one oval.

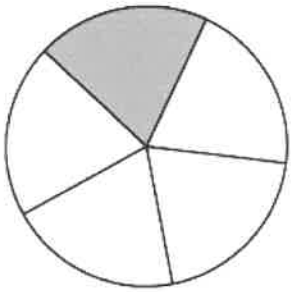
- A
- B
- C
- D

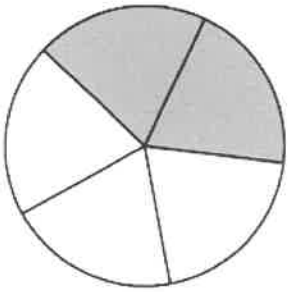
Question 13 * 1 point

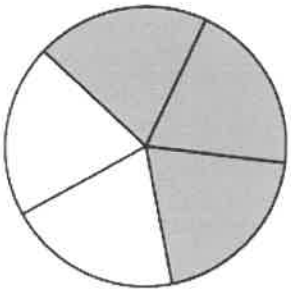
Two friends shared a pie.

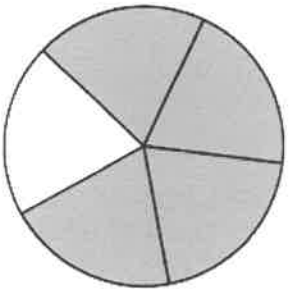
- One friend ate $\frac{2}{5}$ of the whole pie.
- The other friend ate 40% of the whole pie.

In which fraction model does the shaded portion show the fraction of the pie that was **not** eaten?

Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

Mark only one oval.

- A
- B
- C
- D

Question 14 * 1 point

A recipe requires only blueberries and strawberries. This list shows the amounts required for $\frac{1}{4}$ of the whole recipe:

- $\frac{1}{2}$ cup blueberries
- $\frac{2}{5}$ cup strawberries

What is the number of cups of blueberries and the number of cups of strawberries required for the whole recipe?

Ⓐ $\frac{1}{8}$ cup of blueberries and $\frac{1}{10}$ cup of strawberries

Ⓑ $\frac{1}{8}$ cup of blueberries and $1\frac{3}{5}$ cups of strawberries

Ⓒ 2 cups of blueberries and $\frac{1}{10}$ cup of strawberries

Ⓓ 2 cups of blueberries and $1\frac{3}{5}$ cups of strawberries

Mark only one oval.

- ◯ A
- ◯ B
- ◯ C
- ◯ D

Question 15 * 1 point

Which of the following is **not** equivalent to this expression?

$$2m + 10m + 14 + 3$$

Ⓐ $m + 12m + 8 + 9$

Ⓑ $2m + 10 + 10m + 7$

Ⓒ $6m + 6m - 1 + 18$

Ⓓ $15m + 15 - 3m + 2$

Mark only one oval.

- A
- B
- C
- D

Question 16 * 1 point

This table shows the relationship between h, the number of hours a car is parked at a parking meter, and q, the number of quarters it costs to park at the parking meter.

Parking Meter Costs

Number of Hours (h)	Number of Quarters (q)
$\frac{1}{2}$	1
1	2
$1\frac{1}{2}$	3
2	4

Which of the following equations **best** models the relationship between h and q?

Ⓐ $q = h$

Ⓑ $q = 2h$

Ⓒ $q = h + 1$

Ⓓ $q = h + 2$

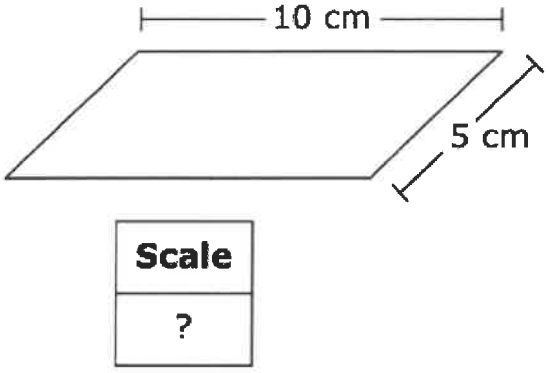
Mark only one oval.

- A
- B
- C
- D

Question 17 *

1 point

A parking lot in the shape of a parallelogram has a length of 300 meters and a width of 150 meters. A scale drawing of the parking lot has a length of 10 centimeters and a width of 5 centimeters, as shown.



Which of the following is the scale used in the drawing?

Ⓐ 1 centimeter = 10 meters

Ⓑ 1 centimeter = 15 meters

Ⓒ 1 centimeter = 30 meters

Ⓓ 1 centimeter = 60 meters

Mark only one oval.

- A
- B
- C
- D

Question 18 *

1 point

Jacinta has 2 blue marbles, 4 red marbles, and 5 green marbles in a bag. All the marbles are the same size. She will select one marble from the bag without looking.

What is the probability that Jacinta will select a green marble?

Ⓐ $\frac{1}{3}$

Ⓑ $\frac{5}{6}$

Ⓒ $\frac{5}{11}$

Ⓓ $\frac{6}{11}$

Mark only one oval.

- A
- B
- C
- D

Question 19 * 1 point

A watermelon that weighed 12 pounds cost $5.76. What was the cost per **ounce** of the watermelon?

Ⓐ $0.48

Ⓑ $0.36

Ⓒ $0.03

Ⓓ $0.02

Mark only one oval.

- A
- B
- C
- D

Question 20 * 1 point

A grocery store manager wants to conduct a survey to determine the average number of items bought by shoppers in the express checkout lane weekly between 5:00 p.m. and 7:00 p.m.

Which of the following plans would obtain a random sample that **best** represents the population of shoppers during this time?

Ⓐ Count the number of items bought by each shopper in the express checkout lane on Monday night between 5:00 p.m. and 7:00 p.m.

Ⓑ Count the number of items bought by each shopper in the express checkout lane between 5:00 p.m. and 5:10 p.m. each evening for a week.

Ⓒ Choose a day of the week at random, and count the number of items bought by each shopper in the express checkout lane between 5:00 p.m. and 7:00 p.m on that day.

Ⓓ Choose eight random 10-minute intervals between 5:00 p.m. and 7:00 p.m. during a week, and count the number of items bought by each shopper in the express checkout lane during the intervals.

Mark only one oval.

- ◯ A
- ◯ B
- ◯ C
- ◯ D

2023 MATHLETES CHALLENGE

CHAMPIONSHIP

TEST 2

KEY

2023 Mathletes Challenge Championship

Test 2 - You will have 20 minutes to complete this 20 question test. Good luck!

* Required

What is your team name? Example: Terry Team 2 *

Championship Test - 2 of 2

Question 1 * 1 point

Mandy is walking in the woods. She completes 70% of her walk in $3\frac{1}{2}$ hours. She continues walking at that same rate. How much time, in hours, will Mandy's entire walk take?

A. $3\frac{4}{5}$

B. 5

C. 6

D. $6\frac{1}{2}$

Mark only one oval.

- ( ) A
- (●) B
- ( ) C
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Question 2 *

1 point

The table below shows the relationship between the amount of electricity used by a customer in different months and the cost shown on the customer's electric bill.

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B. $0.095x > 65.00$

C. $0.92x < 65.00$

D. $0.92x > 65.00$

Mark only one oval.

- [x] A
- [ ] B
- [ ] C
- [ ] D

Question 3 * 1 point

The table below shows the numbers of pages Lenny can read in certain amounts of time.

Lenny's Reading Rate

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60	108
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Based on the table, which equation can be used to determine the number of pages (p) Lenny can read in t minutes?

A. $p = 1.5t$

B. $p = 1.8t$

C. $t = 1.5p$

D. $t = 1.8p$

Mark only one oval.

- ( ) A
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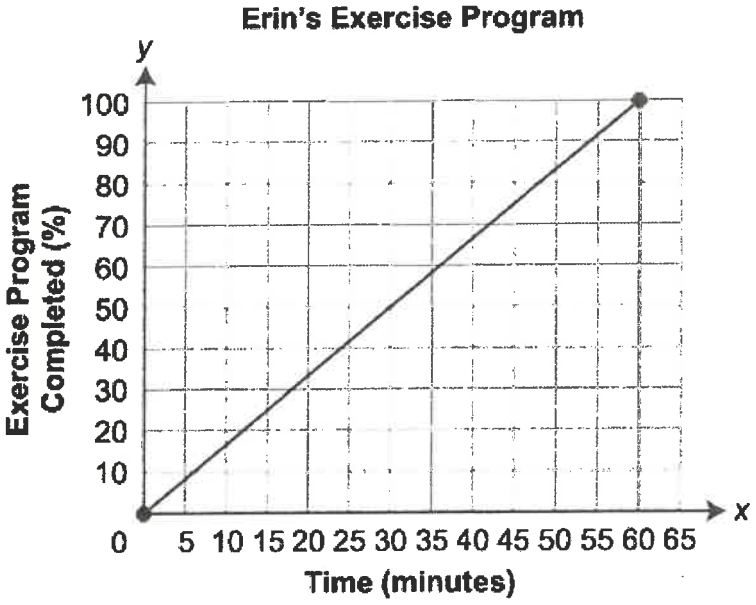
Question 4 * 1 point

Erin completes an exercise program at a fitness center. The graph shown below represents the percentage of her exercise program (y) Erin has completed when she has exercised for x minutes.



Based on the graph, what does the value of the y-coordinate represent when $x = 15$?

A. Erin has completed 9% of her exercise program.
B. Erin has completed 25% of her exercise program.
C. Erin has completed 9 minutes of her exercise program.
D. Erin has completed 25 minutes of her exercise program.

Mark only one oval.

- ◯ A
- ● B
- ◯ C
- ◯ D

Question 5 *

1 point

A stone with a triangular face is used in a water fountain. Lennox made a scale drawing of the triangular face. He labels the vertices of his triangle as P, Q, and R. The sides of triangle PQR are described below.

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A. $8\frac{1}{2}$

B. $18\frac{1}{2}$

C. 34

D. 74

Mark only one oval.

- ( ) A
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Question 6 * 1 point

Which expression is equivalent to 24(807)?

A. 20(8) + 4(8) + 20(7) + 4(7)

B. 20(80) + 4(80) + 20(7) + 4(7)

C. 20(800) + 4(800) + 20(7) + 4(7)

D. 20(800) + 4(800) + 20(70) + 4(70)

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Question 7 * 1 point

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- [x] A
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Question 8 * 1 point

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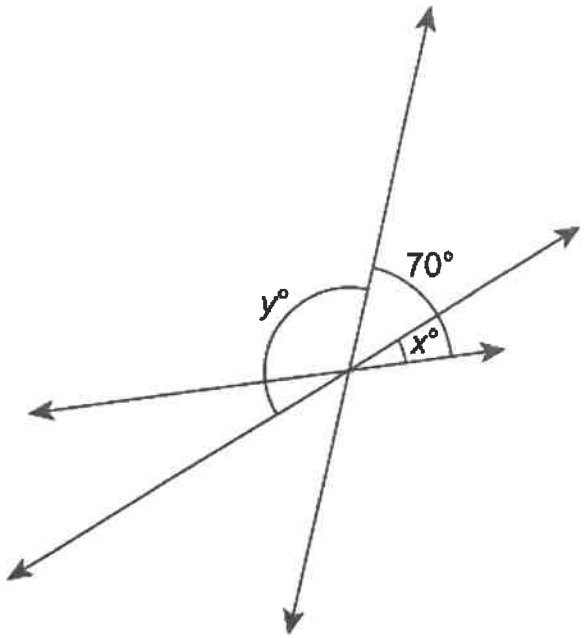

Which statement **best** describes all the possible measures for the angle labeled $y°$?

A. The measure of the angle is $x°$, and it is between 0° and 70°.
B. The measure of the angle is $x°$, and it is between 110° and 180°.
C. The measure of the angle is $110° + x°$, and it is between 0° and 70°.
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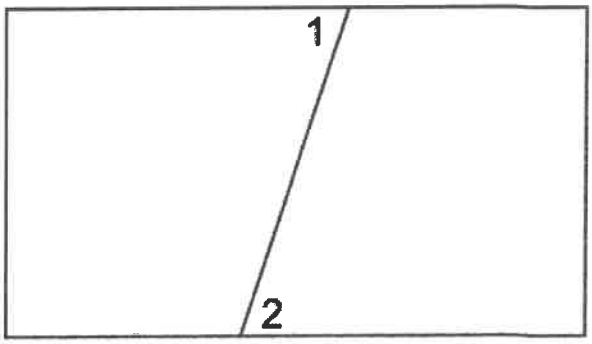
Question 9 * 1 point

A rectangle is shown below.



Which term describes the relationship between angle 1 and angle 2?

A. alternate exterior angles

B. corresponding angles

C. alternate interior angles

D. vertical angles

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- ( ) A
- ( ) B
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Question 10 * 1 point

. A town has a population of 7,500. The mayor asked two different employees to conduct a survey to determine whether residents of the town are in favor of the construction of a new baseball stadium.

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B. Denise's survey is more reliable than Tamira's survey, and approximately 1,250 residents of the town would likely be opposed to the construction of a new baseball stadium.

C. Tamira's survey is more reliable than Denise's survey, and approximately 1,500 residents of the town would likely be in favor of the construction of a new baseball stadium.

D. Tamira's survey is more reliable than Denise's survey, and approximately 6,000 residents of the town would likely be opposed to the construction of a new baseball stadium.

Mark only one oval.

- ◯ A
- ◯ B
- ● C
- ◯ D

Question 11 *

1 point

Mr. Eliaz randomly selects a student from his algebra class each day. Each student is equally likely to be selected. There is an equal number of male and female students in his class. On Monday, Tuesday, Wednesday, and Thursday of this week, the randomly selected student is a male student. Which statement **best** describes the probability Mr. Eliaz selects a male student on Friday?

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D. The probability Mr. Eliaz selects a male student on Friday is impossible to determine without knowing how many students are in his class.

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- (●) A
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Question 12 *

1 point

A nursery sells tulip plants. Each plant has 1 tulip. The tulips come in 4 different colors. The tulip plants available at the nursery are listed below.

- 22 plants with a red tulip
- 30 plants with a pink tulip
- 28 plants with a yellow tulip
- 20 plants with a white tulip

Amy purchases one tulip plant at random. What is the probability that Amy's tulip plant has a tulip that is **not** pink?

A. $\frac{1}{4}$

B. $\frac{3}{10}$

C. $\frac{7}{10}$

D. $\frac{3}{4}$

Mark only one oval.

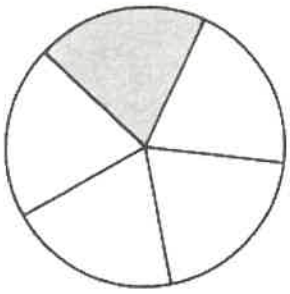
- ( ) A
- ( ) B
- (●) C
- ( ) D

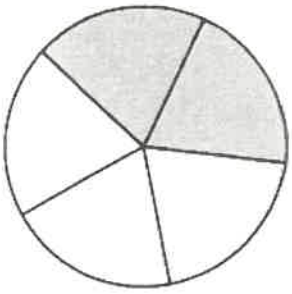
Question 13 * 1 point

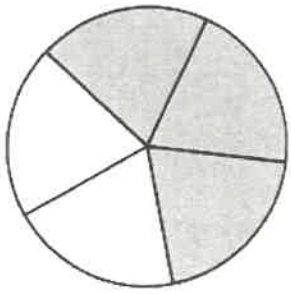
Two friends shared a pie.

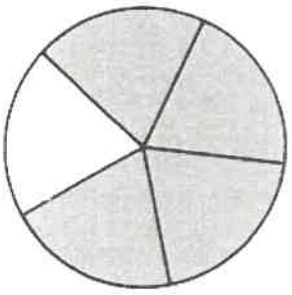
- One friend ate $\frac{2}{5}$ of the whole pie.
- The other friend ate 40% of the whole pie.

In which fraction model does the shaded portion show the fraction of the pie that was **not** eaten?

Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

Mark only one oval.

- [x] A
- [ ] B
- [ ] C
- [ ] D

Question 14 * 1 point

A recipe requires only blueberries and strawberries. This list shows the amounts required for $\frac{1}{4}$ of the whole recipe:

- $\frac{1}{2}$ cup blueberries
- $\frac{2}{5}$ cup strawberries

What is the number of cups of blueberries and the number of cups of strawberries required for the whole recipe?

Ⓐ $\frac{1}{8}$ cup of blueberries and $\frac{1}{10}$ cup of strawberries

Ⓑ $\frac{1}{8}$ cup of blueberries and $1\frac{3}{5}$ cups of strawberries

Ⓒ 2 cups of blueberries and $\frac{1}{10}$ cup of strawberries

Ⓓ 2 cups of blueberries and $1\frac{3}{5}$ cups of strawberries

Mark only one oval.

- ◯ A
- ◯ B
- ◯ C
- ● D

Question 15 * 1 point

Which of the following is **not** equivalent to this expression?

$$2m + 10m + 14 + 3$$

Ⓐ $m + 12m + 8 + 9$

Ⓑ $2m + 10 + 10m + 7$

Ⓒ $6m + 6m - 1 + 18$

Ⓓ $15m + 15 - 3m + 2$

Mark only one oval.

- [x] A
- [ ] B
- [ ] C
- [ ] D

Question 16 * 1 point

This table shows the relationship between h, the number of hours a car is parked at a parking meter, and q, the number of quarters it costs to park at the parking meter.

Parking Meter Costs

Number of Hours (h)	Number of Quarters (q)
$\frac{1}{2}$	1
1	2
$1\frac{1}{2}$	3
2	4

Which of the following equations **best** models the relationship between h and q?

Ⓐ $q = h$

Ⓑ $q = 2h$

Ⓒ $q = h + 1$

Ⓓ $q = h + 2$

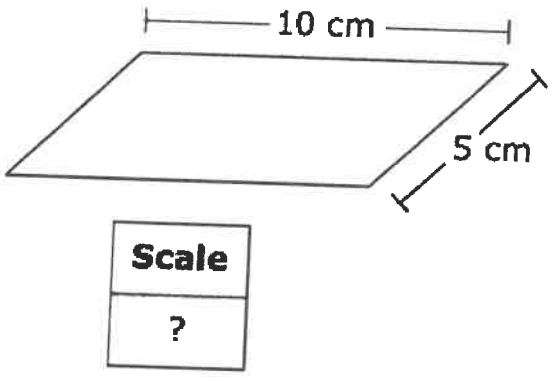
Mark only one oval.

- ( ) A
- (B) B
- ( ) C
- ( ) D

Question 17 *

1 point

A parking lot in the shape of a parallelogram has a length of 300 meters and a width of 150 meters. A scale drawing of the parking lot has a length of 10 centimeters and a width of 5 centimeters, as shown.



Which of the following is the scale used in the drawing?

Ⓐ 1 centimeter = 10 meters

Ⓑ 1 centimeter = 15 meters

Ⓒ 1 centimeter = 30 meters

Ⓓ 1 centimeter = 60 meters

Mark only one oval.

- ( ) A
- ( ) B
- (●) C
- ( ) D

Question 18 *

1 point

Jacinta has 2 blue marbles, 4 red marbles, and 5 green marbles in a bag. All the marbles are the same size. She will select one marble from the bag without looking.

What is the probability that Jacinta will select a green marble?

Ⓐ $\frac{1}{3}$

Ⓑ $\frac{5}{6}$

Ⓒ $\frac{5}{11}$

Ⓓ $\frac{6}{11}$

Mark only one oval.

- ◯ A
- ◯ B
- ● C
- ◯ D

Question 19 * 1 point

A watermelon that weighed 12 pounds cost $5.76. What was the cost per **ounce** of the watermelon?

Ⓐ $0.48

Ⓑ $0.36

Ⓒ $0.03

Ⓓ $0.02

Mark only one oval.

- ◯ A
- ◯ B
- ● C
- ◯ D

Question 20 * 1 point

A grocery store manager wants to conduct a survey to determine the average number of items bought by shoppers in the express checkout lane weekly between 5:00 p.m. and 7:00 p.m.

Which of the following plans would obtain a random sample that **best** represents the population of shoppers during this time?

Ⓐ Count the number of items bought by each shopper in the express checkout lane on Monday night between 5:00 p.m. and 7:00 p.m.

Ⓑ Count the number of items bought by each shopper in the express checkout lane between 5:00 p.m. and 5:10 p.m. each evening for a week.

Ⓒ Choose a day of the week at random, and count the number of items bought by each shopper in the express checkout lane between 5:00 p.m. and 7:00 p.m on that day.

Ⓓ Choose eight random 10-minute intervals between 5:00 p.m. and 7:00 p.m. during a week, and count the number of items bought by each shopper in the express checkout lane during the intervals.

Mark only one oval.

- ◯ A
- ◯ B
- ◯ C
- ● D