Name: _____ Date: _____

Assessment Guide
Cumulative Review 1

50

Suggested Time: 45 min

Section A Multiple-Choice Questions

(10 × 2 = 20 points)

1. Which is the absolute value of $-\frac{51}{119}$ in simplest form?

   (A) $-\frac{51}{119}$

   (B) $\frac{51}{119}$

   (C) $\frac{3}{7}$

   (D) $\frac{4}{17}$

2. Which decimals are equivalent to $3\frac{3}{11}$?

   Choose **all** that apply.

   (A) 3.27

   (B) 3.272

   (C) $3.\overline{272}$

   (D) 3.2727...

   (E) $3.\overline{27}$

3. What is the value of $-24 + (-33) + 43$?

   (A) 14

   (B) -14

   (C) -52

   (D) 52

Name: _____ Date: _____

Assessment Guide
Cumulative Review 2

50

Suggested Time: 45 min

Section A Multiple-Choice Questions

(10 × 2 = 20 points)

1. Which equation is equivalent to $3x - 1.2 = 2.7$?

   (A) $3x = 1.5$

   (B) $x = 1.3$

   (C) $3x - 3.5 = 0$

   (D) $x + 3.9 = 0$

2. Which is the solution of the equation $\frac{2}{5}(10x - 15) - 6 = 0$?

   (A) 3

   (B) 5

   (C) 6

   (D) 4

3. Which values satisfy the inequality $10 - 3x < -2$?

   Choose **all** that apply.

   (A) $3\frac{5}{8}$

   (B) 4

   (C) 5

   (D) 4.5

   (E) $4\frac{1}{8}$

   (F) 2

4 The sum of two consecutive even numbers is 94. What is the greater number?

(A) 44

(B) 46

(C) 48

(D) 50

5 Daniel is twice as old as his son now. He was 20 years older than his son 5 years ago. How old is Daniel now?

(A) 20

(B) 30

(C) 40

(D) 50

6 Which table shows a proportional relationship between the consumption of gasoline and the distance traveled by a heavy truck?

(A)

Distance (miles)	6	13	33
Consumption (gallons)	1	2	5

(B)

Distance (miles)	6.5	13	32.5
Consumption (gallons)	1	2	5

(C)

Distance (miles)	6	18	31
Consumption (gallons)	1	3	5

(D)

Distance (miles)	6.5	13	18
Consumption (gallons)	1	2	3

7 All items in a shop were sold at 20% discount during a sale. A cap was bought at $40. What was its selling price?

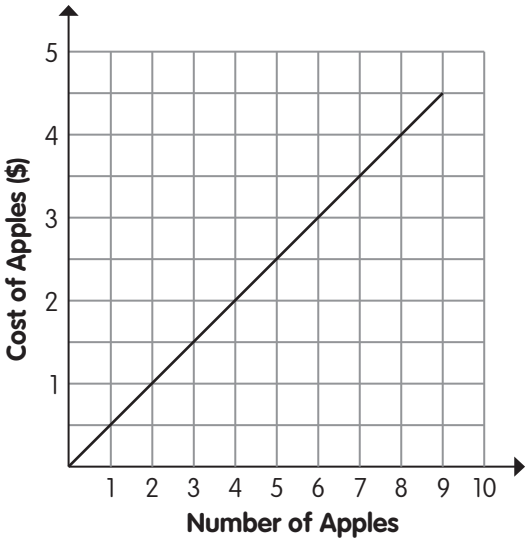
(A) $50

(B) $48

(C) $32

(D) $80

8 The graph shows a proportional relationship between the number of apples bought and the cost of the apples.



Which point on the graph shows the unit rate?

(A) (1, 2)

(B) (2, 1)

(C) (1, 0.5)

(D) (2, 4)

9 The price of a car decreased from $20,000 in 2014 to $12,000 in 2018. What was the percent decrease in its price?

(A) 60%

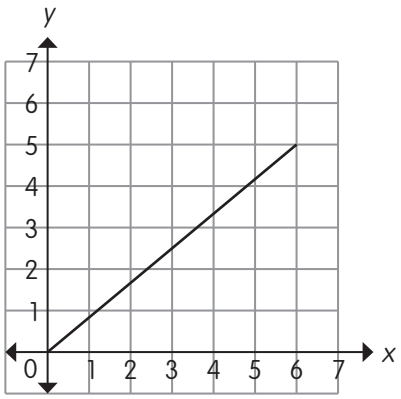
(B) 40%

(C) 67%

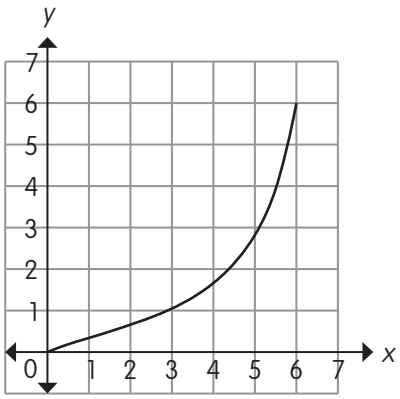
(D) 100%

10 Which graph shows an inverse proportion?

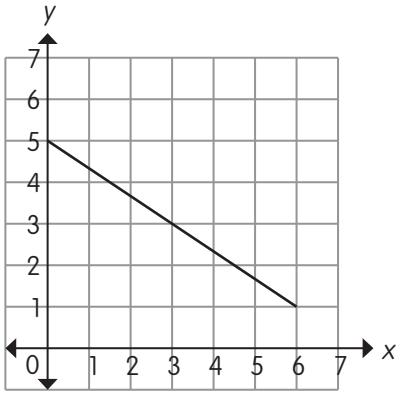
(A)



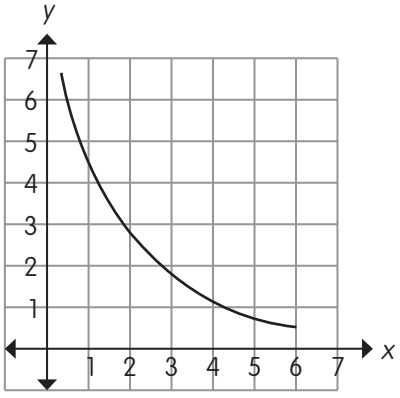
(B)



(C)



(D)



Section B Short Answer Questions

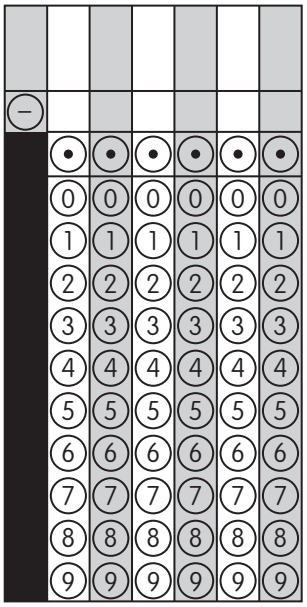
(11 to 20: 2 points each)

11 Solve the equation $\frac{1}{3}x - \frac{1}{4} = \frac{1}{6}$.

Write your answer in the space below.

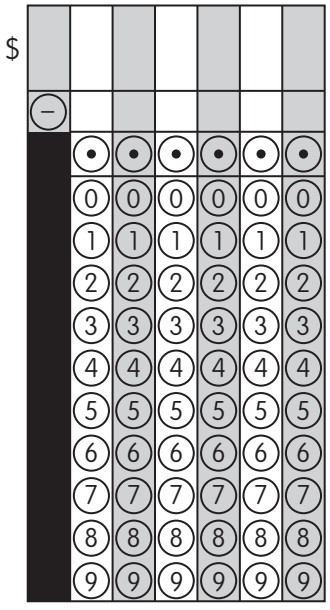
12 Solve the equation $2.1(2a - 1) + 1.5 - 3.6a = 0$.

Write your answer in the answer grid.



13 A bagel and a cup of coffee cost \$5. The bagel costs \$1.60 less than the cup of coffee. How much does the cup of coffee cost?

Write your answer in the answer grid.



14 Solve the inequality $4x - 3 \geq 9$, and graph the solution set on a number line.

Show your answer and drawing in the space below.

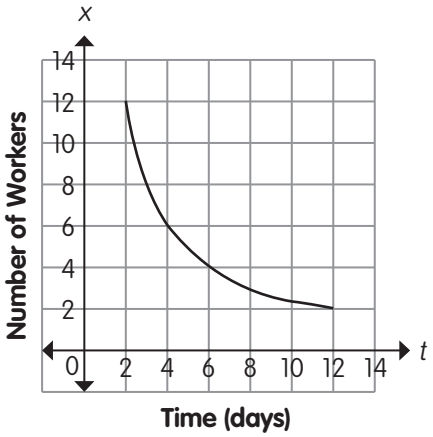
15 The yearly assessment for science is the average score of 5 tests. Lola scored 57, 66, and 70 for her first 3 tests. What is the minimum average score she must get for the last 2 tests for Lola to get at least 70 for her yearly assessment?

Write your answer and your work or explanation in the space below.

16 The area of a right triangle is 13 square feet. The height in feet, h, of the triangle is inversely proportional to its base in feet, b. Find an inverse proportion equation to show this relationship.

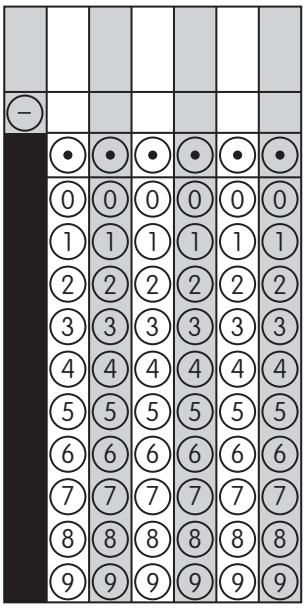
Write your answer in the space below.

17 The number of workers to repair a ship is inversely proportional to the number of days to complete the task. The graph below shows the time in days, t, it takes x workers to repair the ship.



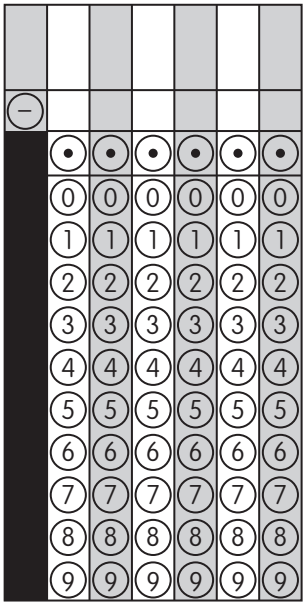
How many workers are needed to repair the ship in 4 days?

Write your answer in the answer grid.



18 y is inversely proportional to x, and $y = 6$ when $x = 12$. Find the value of y when $x = 48$.

Write your answer in the answer grid.

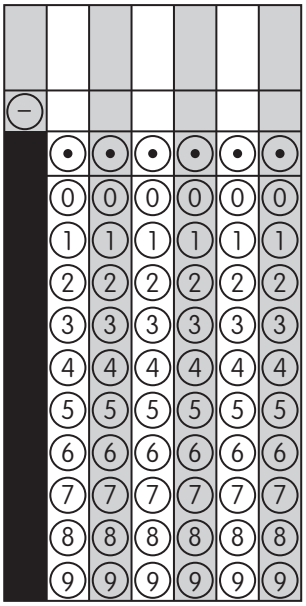


19 A watch priced at $1,200 decreased by 25%, and then increased by 50%. What was the increase in its price?

Explain your answer in the space below.

20 To clear the bagels off the shelves, a baker puts up a sign showing "buy 4 get 1 free".
What is the percent discount?

Write your answer in the answer grid.



Section C Constructed Response

(21: 3 points; 22: 3 points; 23: 4 points)

21 This question has two parts.

Part A

Carla says that the equation $3(5x + 4) = 15x + 12$ has no solution, because $3(5x + 4)$ can be written as $15x + 12$.

Do you agree?

Explain your answer in the space below.

Part B

Carson says that the solution of the equation $3(5x + 4) = 57$ is $\frac{23}{5}$. The steps below show how he worked out the answer.

$3(5x + 4) = 57$

$15x + 12 = 57$

$15x = 12 + 57$

$15x = 69$

$x = \frac{69}{15}$

$= \frac{23}{5}$

- Identify the mistake Carson made in his work.
- Solve $3(5x + 4) = 57$ for x.

Show your work and answer in the space below.

22 Avery, Brooke, Caden, and Dominic collected some pebbles.

- Avery collected d pebbles.
- Avery collected 10 pebbles fewer than Brooke.
- Caden collected four times as many pebbles as Brooke.
- Dominic collected $(d + 3)$ pebbles.

The total number of pebbles collected by the four children does not exceed 88. What are the possible values of d?

Write your answer and your work or explanation in the space below.

23 This question has two parts.

Grapes are sold at different prices in three stores as shown.

Happy Fruit Shop	Vitamin C Home	Super Fruit
$2.80 per pound	$2 per 8 ounces	$1.60 per 6 ounces

Part A
Which store offers the best deal?

Explain your answer in the space below.

Part B
Grapes at the Happy Fruit Shop are sold at 25% discount. Mr. Martin buys $(x + 0.5)$ pounds of grapes from the shop. If he pays $5.25 for the grapes, form an equation in x and solve it for x.

Write your answer and your work or explanation in the space below.

Name: _____ Date: _____

Assessment Guide
Cumulative Review 3

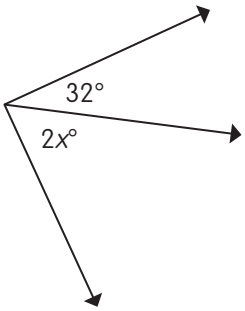
50

Suggested Time: 45 min

Section A Multiple-Choice Questions

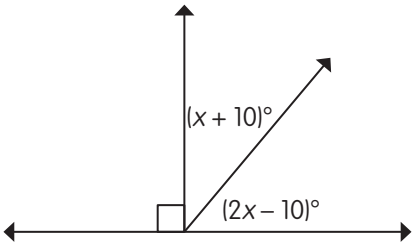
(10 × 2 = 20 points)

1 The diagram shows a pair of complementary angles. What is the value of x?



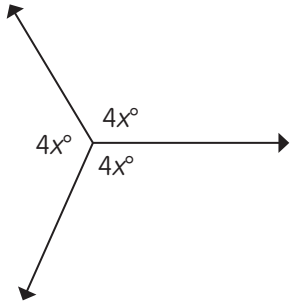
(A) 29
(B) 58
(C) 64
(D) 122

2 What is the value of x?



(A) 10
(B) 20
(C) 30
(D) 40

3 What is the value of x?



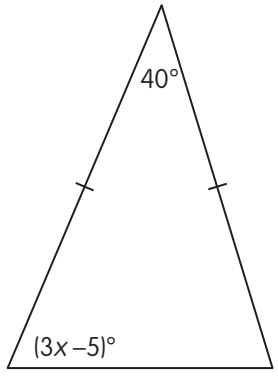
(A) 20

(B) 30

(C) 40

(D) 50

4 What is the value of x?



(A) $16\frac{2}{3}$

(B) $21\frac{2}{3}$

(C) 25

(D) 30

5 Which set of information allows you to draw two possible triangles?

(A) $XY = 13$ cm, $YZ = 10$ cm, and $XZ = 2$ cm

(B) $XY = 10$ cm, $YZ = 24$ cm, and $XZ = 26$ cm

(C) $XY = 10$ cm, $m\angle X = 40°$, and $m\angle Y = 50°$

(D) $XY = 4$ cm, $m\angle X = 60°$, and $YZ = 3.7$ cm

6 A model of the Empire State building measures 7.6 cm tall. It is molded in plastic on a scale of 1 : 5,000. What is the actual height in meters of the building?

(A) 152

(B) 190

(C) 380

(D) 570

7 A park has an area of 49 square centimeters on a map of scale 1 : 20,000. What is its actual area in square kilometers?

(A) 98

(B) 1.4

(C) 9.8

(D) 1.96

8 A circle has a circumference of 72π centimeters. What is its radius in centimeters?

(A) 72

(B) 36

(C) 18

(D) 9

9 Luke measured that the distance around a circular pond is 100π feet. What is its area in square feet?

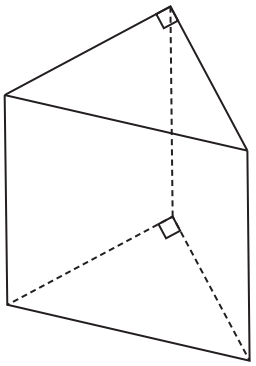
(A) 100π

(B) 200π

(C) $2{,}500\pi$

(D) $10{,}000\pi$

10 Which is the shape of the cross section of the prism shown?



(A) Square

(B) Parallelogram

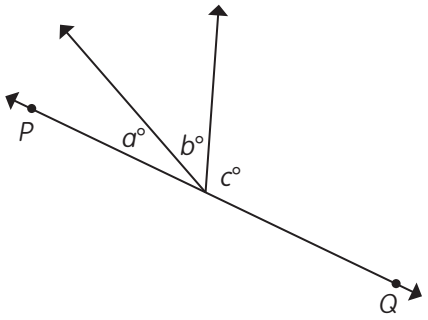
(C) Triangle

(D) Rectangle

Section B Short Answer Questions

(11 to 20: 2 points each)

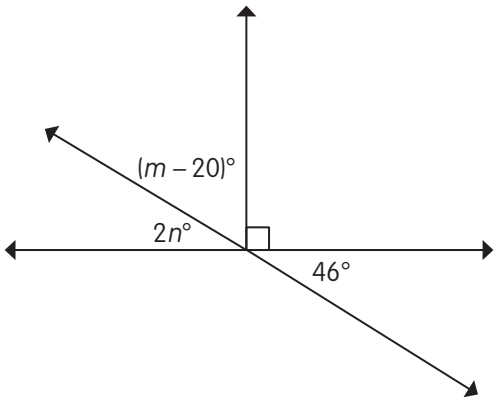
11 In the diagram, $\overleftrightarrow{PQ}$ is a straight line and the ratio $a : b : c = 1 : 2 : 5$.



Find the values of a, b, and c.

Write your answers in the space below.

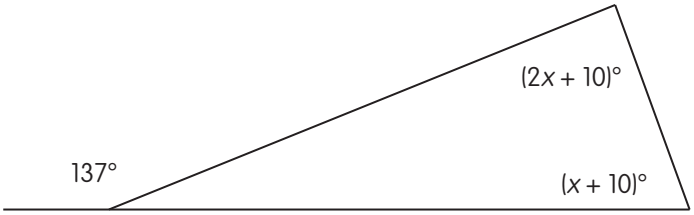
12



Which would you solve for first, *m* or *n*?

Explain how you worked out the values of *m* and *n* in the space below.

13



What is the value of x?

Write your answer in the answer grid.

	⊖					
	⊙	⊙	⊙	⊙	⊙	⊙
	0	0	0	0	0	0
	1	1	1	1	1	1
	2	2	2	2	2	2
	3	3	3	3	3	3
	4	4	4	4	4	4
	5	5	5	5	5	5
	6	6	6	6	6	6
	7	7	7	7	7	7
	8	8	8	8	8	8
	9	9	9	9	9	9

14 A lake was drawn on two different maps. Map A has a scale of 1 cm : 500 m. Map B has a scale of 1 : 80,000. Evan says that the area of the lake on Map A is 2.56 times its area on Map B.

Do you agree?

Explain your answer in the space below.

15 The area of a garden is 100 square meters. It measures 4 square centimeters on a floor plan. What is the scale factor of the floor plan?

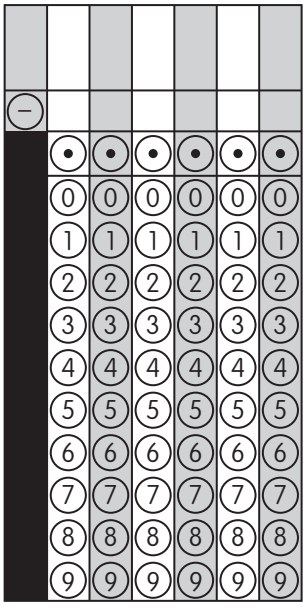
Write your answer in the space below.

16 The curved surface areas of a concrete dome and its model are 162 square meters and 18 square centimeters respectively. What is the diameter in meters of the actual dome if the diameter of the model is 2.4 centimeters?

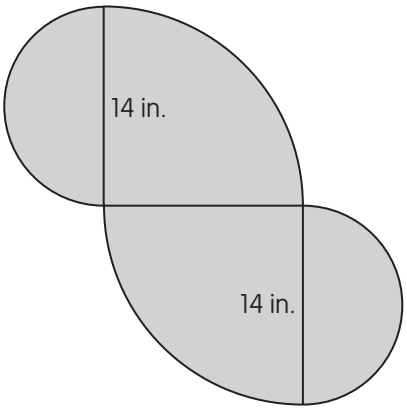
Write your answer and your work or explanation in the space below.

17 The diameter of a bicycle wheel is 20 inches. What is the distance covered in inches by the wheel after it has made 7 revolutions? Use $\frac{22}{7}$ as an approximation for π.

Write your answer in the answer grid.



18 The shape of a rug is made up of two semicircles of diameter 14 inches and two quadrants as shown.

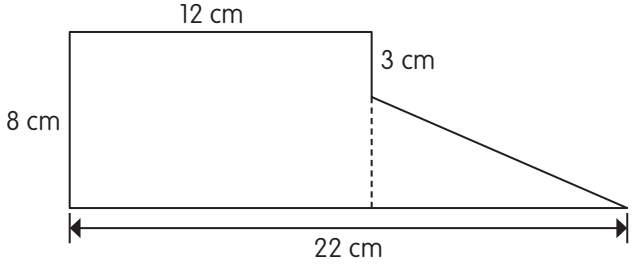


What is the area in square inches of the rug? Use $\frac{22}{7}$ as an approximation for π.

Write your answer in the answer grid.

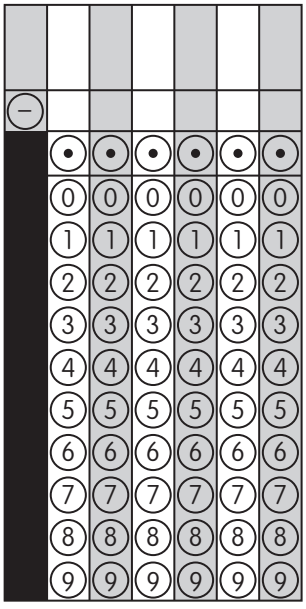
−						
	•	•	•	•	•	•
	0	0	0	0	0	0
	1	1	1	1	1	1
	2	2	2	2	2	2
	3	3	3	3	3	3
	4	4	4	4	4	4
	5	5	5	5	5	5
	6	6	6	6	6	6
	7	7	7	7	7	7
	8	8	8	8	8	8
	9	9	9	9	9	9

19 This figure is made up of a rectangle and a triangle.

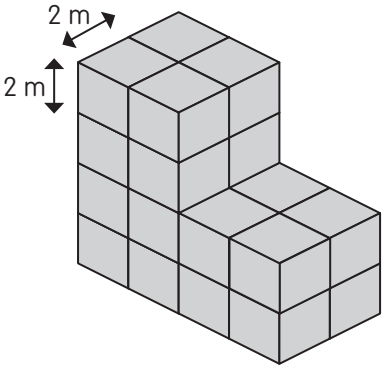


What is its area in square centimeters?

Write your answer in the answer grid.



20 Cubes of side 2 meters are stacked to form an L-shaped solid as shown.



What is the volume in cubic meters of the solid?

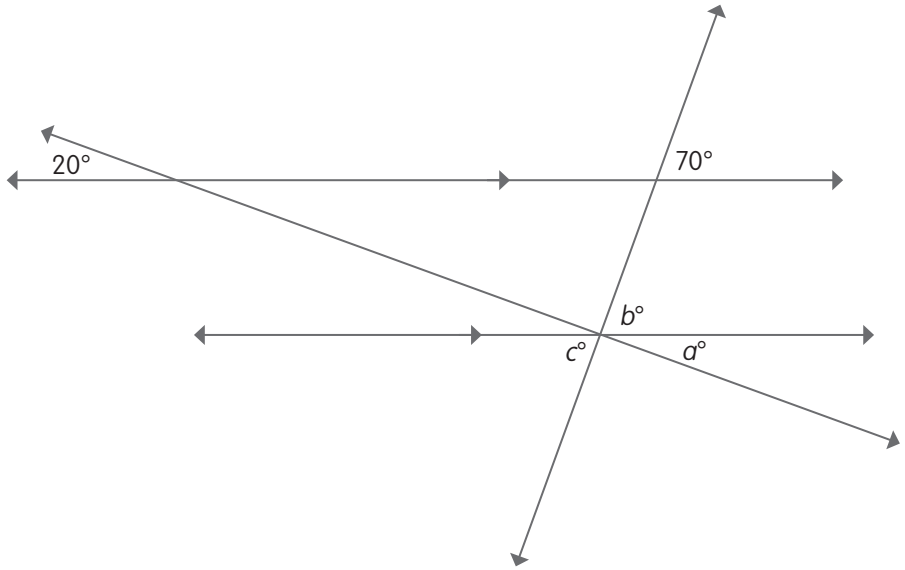
Write your answer in the answer grid.

−						
	⊙	⊙	⊙	⊙	⊙	⊙
	0	0	0	0	0	0
	1	1	1	1	1	1
	2	2	2	2	2	2
	3	3	3	3	3	3
	4	4	4	4	4	4
	5	5	5	5	5	5
	6	6	6	6	6	6
	7	7	7	7	7	7
	8	8	8	8	8	8
	9	9	9	9	9	9

Section C Constructed Response

(21: 3 points; 22: 3 points; 23: 4 points)

21 This question has two parts.



Part A

Explain why angles $a°$ and $b°$ are complementary angles.

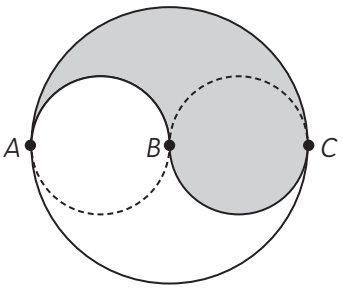
Show your explanation in the space below.

Part B
If $a = x + 8$ and $b = 2x - 20$, what is the value of c?

Write your answer and your work or explanation in the space below.

22 This question has two parts.

Part A
In the figure below, point B is the center of the largest circle of radius r meters.

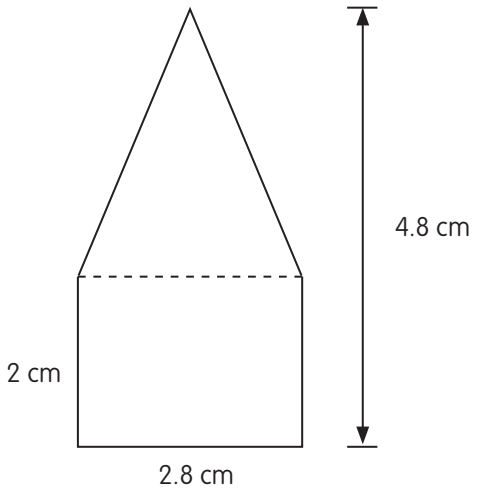


Explain why the area of the shaded region is half the area of the largest circle.

Show your explanation in the space below.

Part B

A rectangular block of gold measuring 4 cm by 6 cm by 8 cm is melted and cast into pendants. Each pendant is 0.2 cm thick, and its cross section is formed by an isosceles triangle and a rectangle with dimensions shown below.

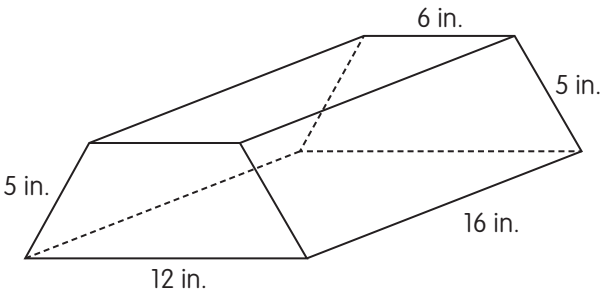


There is a loss of 2% in volume due to melting and casting. How many pendants can be made from the rectangular block of gold?

Write your answer and your work or explanation in the space below.

23 This question has two parts.

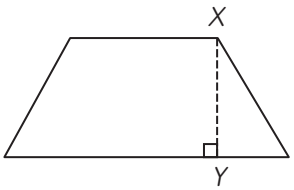
An open container is a trapezoidal prism with dimensions shown below.



Part A

The container can hold at most a volume of 576 cubic inches. What is the height in inches, *XY* of the trapezoidal prism?

Write your answer and your work or explanation in the space below.



Part B

Thomas filled the container with sand to a height of 2 inches. The sand had a volume of 336 cubic inches. Find the area of the sand that was not in contact with the container.

Write your answer and your work or explanation in the space below.

Name: _____ Date: _____

Assessment Guide
Cumulative Review 4

50

Suggested Time: 45 min

Section A Multiple-Choice Questions

(10 × 2 = 20 points)

1. Adam, a high school teacher, wants to find out the favorite subjects of students in his school. He knows that the names of all the students have been stored into a computer database. So, he writes a computer program that will randomly select 30 names from each level. Then, he contacts these students for his survey.
Which sampling method does Adam use?

   (A) Simple random sampling

   (B) Stratified random sampling

   (C) Systematic random sampling

   (D) None of the above

2. Which statement about a population and a sample is **not** true?

   (A) A sample is a subset of a population.

   (B) A size of a sample is always small and the size of a population is always big.

   (C) The size of a sample is smaller than the size of a population.

   (D) We use a sample to draw inferences about the population we study.

3. If *A* is the event of picking 3 letters randomly from the word "METAL", which are the possible outcomes?
Choose **all** that apply.

   (A) M, E, L

   (B) M, A, N

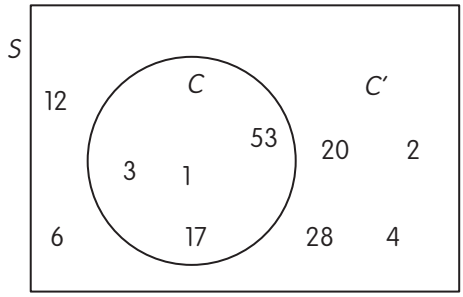
   (C) A, N, T

   (D) F, A, T

   (E) E, A, T

   (F) L, E, T

4 What is the probability of event C in the Venn diagram shown?



A $\frac{1}{2}$

B $\frac{2}{3}$

C $\frac{3}{5}$

D $\frac{2}{5}$

5 A bag contains 8 black, 3 green, 10 yellow, and 9 red balls. What is the probability of getting a yellow ball from the bag?

A $\frac{4}{15}$

B $\frac{1}{3}$

C $\frac{3}{10}$

D $\frac{1}{10}$

6 Lily is busy doing homework at home. Her favorite two-hour TV show starts soon.

What are the possible outcomes for Lily?

(A) Misses the TV show, has done her homework

(B) Misses the TV show, has not done her homework

(C) Does not miss the TV show, has done her homework

(D) Does not miss the TV show, has not done her homework

(E) Misses the TV show, is not at home

(F) Has done her homework, is not at home

7 Which statements are correct?

Choose **all** that apply.

(A) Selecting the letter "Y" from the word "HAPPY" is a compound event.

(B) Selecting a red bead from a box and then a purple marble from a bag is a simple event.

(C) Drawing two dimes with replacement from a purse is a compound event.

(D) Choosing a pair of pants from a wardrobe is a simple event.

(E) Spinning a spinner that is divided into six numbered sections to get an even number or a number greater than 3 is a compound event.

(F) Rolling 3 fair six-sided number dice to get a sum of 12 is a compound event.

8 Ivanna scored 56, 65, 71, 68, and 75 in 5 math tests. Kevin scored 76, 71, 55, 79, and 79 in the 5 math tests. Which statements about their performance are true?

Choose **all** that apply.

(A) Ivanna's scores have a smaller range than Kevin's scores.

(B) Kevin scored better than Ivanna in general.

(C) Ivanna has a more consistent performance than Kevin.

(D) Kevin has a lower MAD to mean ratio than Ivanna.

(E) Ivanna has a higher median score than Kevin.

9 A basket has 3 green and 12 red apples. Luna wants to make apple pies. She takes 2 apples from the basket, one after another, without replacement. What is the probability that both apples are red?

(A) $\frac{12}{15} \times \frac{11}{15}$

(B) $\frac{12}{15} \times \frac{12}{15}$

(C) $\frac{12}{15} \times \frac{11}{14}$

(D) $\frac{12}{15} \times \frac{12}{14}$

10 Which are dependent events?

Choose **all** that apply.

(A) Grace attending a piano lesson on Monday and a drama course on Tuesday

(B) Pedro and Abigail jogging in the park on a sunny day

(C) Aidan attending a concert and getting overtime at work on the same day

(D) Owen parking illegally and getting a parking ticket

(E) Jessica drawing a picture and listening to music

Section B Short Answer Questions

(11 to 15 Part A, 15 Part B, 16 to 19: 2 points each)

11 A spinner is divided into four sections numbered 1 to 4. The spinner is spun once. The table below shows the probability of each outcome.

Outcome	1	2	3	4
Probability	x	y	y	y

It is twice as likely to get the number 1 than any other number. What are the values of x and y?

Explain your answers in the space below.

12 A random sample of 6 students' masses in kilograms is shown.

42, 38, 40, 50, 54, 46

- Find the sample mean.
- Estimate the population mean.

Write your answers in the space below.

13 Mr. Lee has 3 children. The eldest is a daughter. What are the possible combinations of his children?

Using the letter "B" to represent a boy and the letter "G" to represent a girl, write your answer in the space below.

14 In an orchard, 40% of the trees are apple trees, 50% of the remaining trees are oranges, and the rest are peaches. What is the probability of randomly choosing a peach tree from the orchard?

Explain your answer in the space below.

15 This question has two parts.

A die is tossed 300 times. Its observed frequencies and experimental frequencies for some outcomes are tabulated.

Outcome	1	2	3	4	5	6
Observed Frequency	48	53	52	47	51	
Experimental Frequency	50			50		50

Part A

- Write each missing value in the table.
- Explain whether the die is fair or not in the space below.

Part B

- What are the experimental and theoretical probabilities of getting the number 1?
- Are the two probabilities close to each other? Explain why.

Write your answers and explanation in the space below.

16 Claire rolled two fair six-sided dice and jotted down the numbers facing up. Then, she calculated the absolute difference between the pair of numbers. The table below shows some of the outcomes.

Die 2 \ Die 1	1	2	3	4	5	6
1	0	1	2	3	4	5
2		0	1		3	
3	2	1		1		3
4		2	1		1	
5		3			0	
6		4				0

- Write each missing outcome in the table above.
- Write the outcome that has the highest frequency in the space below.

17 There are 3 black ties and 3 white ties in a drawer. Carter randomly picks a tie and replaces it. Then, he randomly picks another tie from the drawer. What is the probability of picking 2 ties of different color?

Write your answer and your work or explanation in the space below.

18 There are 5 dimes and 4 nickels in a purse. 2 coins are drawn randomly from the purse, without replacement. What is the probability of drawing 2 different types of coins?

Write your answer and your work or explanation in the space below.

19 There are 4 black socks and 2 white socks in a bag. 2 socks are picked randomly from the bag, without replacement. The probability of picking 2 black socks is $\frac{x+1}{10}$. What is the value of x?

Write your answer and your work or explanation in the space below.

Section C Constructed Response

(20: 3 points; 21: 3 points 22: 4 points)

20 Jack has 2 pairs of black shoes and 1 pair of white shoes in his wardrobe. He randomly picks a shoe without looking. Then, he randomly picks another shoe to make a pair of shoes for him to wear to work. Jack says that since 2 out of 3 pairs of shoes are black, the probability of getting a pair of black shoes is $\frac{2}{3}$.

- Explain the mistake in Jack's reasoning.
- Find the probability of picking a pair of black shoes.
- Explain how you found the answer.

Show your explanations and answer in the space below.

21 This question has two parts.

Ms. Thompson asked her class of students how many pets they have at home. The table below shows the results of the survey.

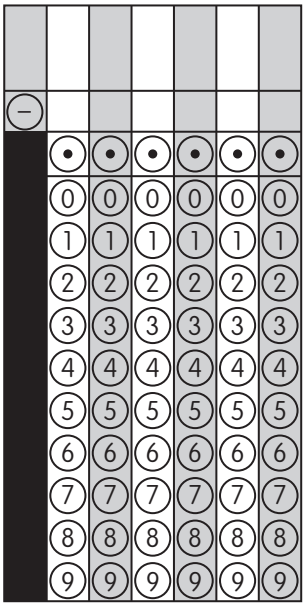
Number of Pets	0	1	2	3	4	5
Relative Frequency	0.3	0.25	0.1	0.05	0.1	0.2

In the school, there are 560 students.

Part A

Predict the number of students in the school that have more than 2 pets.

Write your answer in the answer grid.



Part B
Predict the total number of pets that the students in the school have.

Explain your answer in the space below.

22 There are 2 blue balls and 3 red balls in a box. A ball is picked and its color is noted. If it is blue, it will be returned to the box. If it is red, it will be placed aside. Another ball is picked and its color is noted. What is the probability of picking 2 balls of the same color?

Write your answer and your work or explanation in the space below.

4 23, –4, and –28 are three values on a number line.

How far apart are the least value and the greatest value?

A 51 units

B 5 units

C 32 units

D 27 units

5 Which expression is equivalent to $-6x + 9$?

A $-6(x + 9)$

B $-(6x - 9)$

C $-3(2x + 9)$

D $-3(2x + 3)$

6 Which expression is equivalent to $2.25x + \frac{21}{4}x$?

A $7.6x$

B $7.5x$

C $6.6x$

D $7.25x$

7 Which expressions are equivalent to $6b - \frac{5}{2}b + 3.15b$?

Choose **all** that apply.

A $6.65b$

B $\frac{7}{2}b + 3.15b$

C $7b - \frac{1}{2}b + 0.15b$

D $7b - 0.5b$

E $5b + 1.15b$

8 Which expressions are equivalent to $4d - 7b + 2b - 5d$?

Choose **all** that apply.

A $4d - 5d - 7b + 2b$

B $5d - 4d + 2b - 7b$

C $3d + 3b$

D $-d - 5b$

E $d + 5b$

F $-5b - d$

9 Which expression is equivalent to $0.4\left(\frac{9}{4}c - 6\right)$?

A $0.9c - 6$

B $0.9c - 2.4$

C $9c - 0.46$

D $9c - 2.4$

10 Which expression is equivalent to $3p - 6q + 9$?

A $3(p - 6q + 9)$

B $3(p - 6q + 3)$

C $3(p - 2q + 3)$

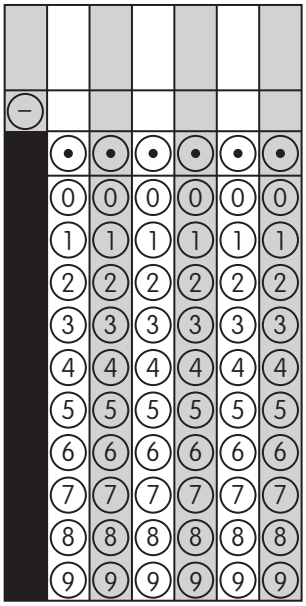
D $3(p - 2q + 9)$

Section B Short Answer Questions

(11 to 19 Part A, 19 Part B: 2 points each)

11 Evaluate $-20 + 45 \div (-3) \times (-2)$.

Write your answer in the answer grid.



12 Ava has a piece of ribbon that is $2\frac{2}{3}$ feet long. She needs $4\frac{1}{4}$ feet of ribbon to decorate her gift boxes. How many more feet of ribbon does Ava need?

Write your answer in the space below.

13 The product of two rational numbers is $2\frac{1}{4}$. If one of the numbers is $-11\frac{1}{2}$, what is the other number?

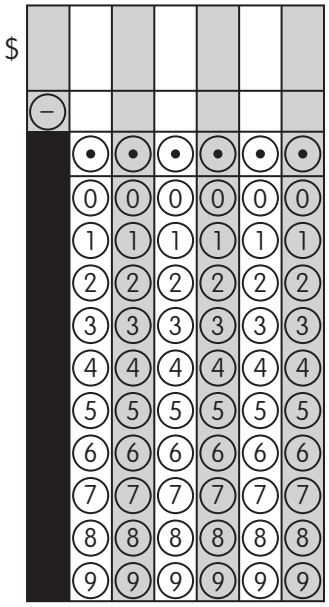
Write your answer in the space below.

14 The table shows part of Ms. Lee's bank account statement.

Date	Money Out	Money In	Balance
1 Jan			$100.00
3 Jan	$50.00		
7 Jan	$480.50		
10 Jan		$120.35	
12 Jan			?

What is Ms. Lee's balance as of 12 Jan?

Write your answer in the answer grid.



15 Maya wants to buy 8 grapefruits and 4 apples. Grapefruits are sold at 4 for $5.20, and apples are sold at 2 for $2.50. Maya has only $12. How much more money does she need?

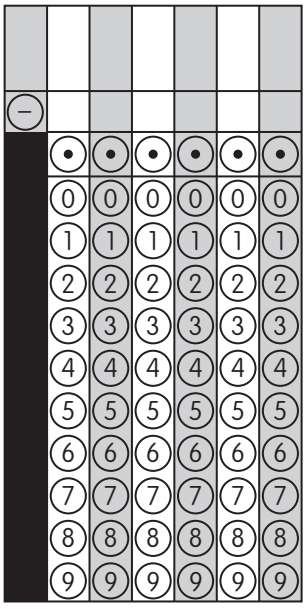
Explain the steps used to compute the amount of money Maya needs.
Write your answer and explanation in the space below.

16 Brian is x years old. Blake is y years older than Brian.

Write an expression for their combined age in 8 years' time in the space below.

17 Simplifying $2x - 3.4x + \frac{13}{2}x - 30x \div 6$ becomes bx, where b is a constant. What is the value of b?

Write your answer in the answer grid.

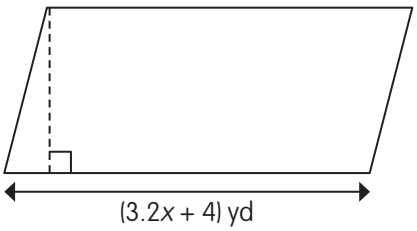


18 Simplify $127b - 89d - 16b + 2d$, and then factor the result.

Write your answer in the space below.

19 This question has two parts.

The base of a parallelogram is $(3.2x + 4)$ yards. Its vertical height is $3.2x$ yards shorter.



Part A

Find an expression for the area of the parallelogram, and expand it.

Write your answer in the space below.

Part B

The area of the parallelogram is $(mx + n + 4x)$ square yards, where m and n are constants. What are the values of m and n?

Explain how you found the answers in the space below.

Section C Constructed Response

(20: 3 points; 21: 3 points; 22: 4 points)

20 Kyle expanded and simplified the expression $3\left(\frac{1}{3}x + 5\right) - (1.2x - 4)$ as follows.

$$\begin{aligned} 3\left(\frac{1}{3}x + 5\right) - (1.2x - 4) &= 3\left(\frac{1}{3}x\right) + 3(5) - 1.2x - 4 \\ &= x + 15 - 1.2x - 4 \\ &= x - 1.2x + 15 - 4 \\ &= -0.2x + 11 \\ &= -10.8x \end{aligned}$$

- Identify the mistakes Kyle made in his work.
- Expand and simplify $3\left(\frac{1}{3}x + 5\right) - (1.2x - 4)$.
- Explain how you found the answer.

Show your work and explanation in the space below.

21 A store sells shirts and blouses. The price of each shirt is $8.60. The price of each blouse is 25% higher than the price of the shirt. All the prices are given before a 20% discount. Cole has only $100. He wants to buy two more blouses than shirts. How many shirts and how many blouses can he buy at most?

Write your answer and your work or explanation in the space below.

22 This question has two parts.

Faith is preparing some fruit for a school outing. Apples are sold in packs of 8 at p dollars per pack. Oranges are sold in packs of 10. The price of a pack of oranges is five-fourths of the price of a pack of apples. 50 students will be going, and each of them will have one apple and one orange. Faith has a budget of $(20p + 20)$ dollars to spend on fruit.

Part A

Express the amount left, in terms of p, after buying the fruit.

Write your answer and your work or explanation in the space below.

Part B

Evaluate the expression for the amount left after buying the fruit, when $p = 5$.

Write your answer and your work or explanation in the space below.

Name: _____ Date: _____

Assessment Guide
Cumulative Review 2

50

Suggested Time: 45 min

Section A Multiple-Choice Questions

(10 × 2 = 20 points)

1. Which equation is equivalent to $3x - 1.2 = 2.7$?

   (A) $3x = 1.5$

   (B) $x = 1.3$

   (C) $3x - 3.5 = 0$

   (D) $x + 3.9 = 0$

2. Which is the solution of the equation $\frac{2}{5}(10x - 15) - 6 = 0$?

   (A) 3

   (B) 5

   (C) 6

   (D) 4

3. Which values satisfy the inequality $10 - 3x < -2$?

   Choose **all** that apply.

   (A) $3\frac{5}{8}$

   (B) 4

   (C) 5

   (D) 4.5

   (E) $4\frac{1}{8}$

   (F) 2

4 The sum of two consecutive even numbers is 94. What is the greater number?

(A) 44

(B) 46

(C) 48

(D) 50

5 Daniel is twice as old as his son now. He was 20 years older than his son 5 years ago. How old is Daniel now?

(A) 20

(B) 30

(C) 40

(D) 50

6 Which table shows a proportional relationship between the consumption of gasoline and the distance traveled by a heavy truck?

(A)

Distance (miles)	6	13	33
Consumption (gallons)	1	2	5

(B)

Distance (miles)	6.5	13	32.5
Consumption (gallons)	1	2	5

(C)

Distance (miles)	6	18	31
Consumption (gallons)	1	3	5

(D)

Distance (miles)	6.5	13	18
Consumption (gallons)	1	2	3

7 All items in a shop were sold at 20% discount during a sale. A cap was bought at $40. What was its selling price?

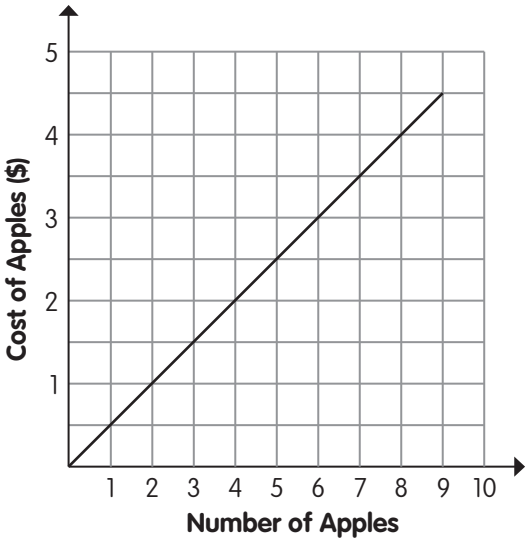
(A) $50

(B) $48

(C) $32

(D) $80

8 The graph shows a proportional relationship between the number of apples bought and the cost of the apples.



Which point on the graph shows the unit rate?

(A) (1, 2)

(B) (2, 1)

(C) (1, 0.5)

(D) (2, 4)

9 The price of a car decreased from $20,000 in 2014 to $12,000 in 2018. What was the percent decrease in its price?

(A) 60%

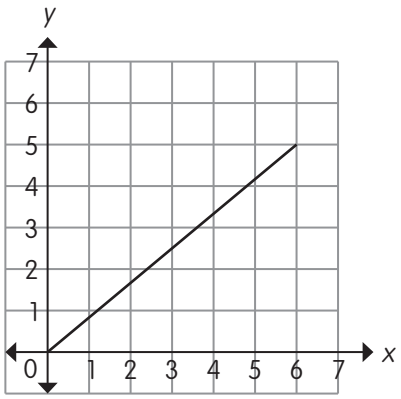
(B) 40%

(C) 67%

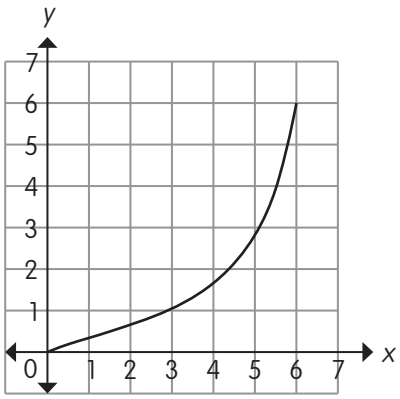
(D) 100%

10 Which graph shows an inverse proportion?

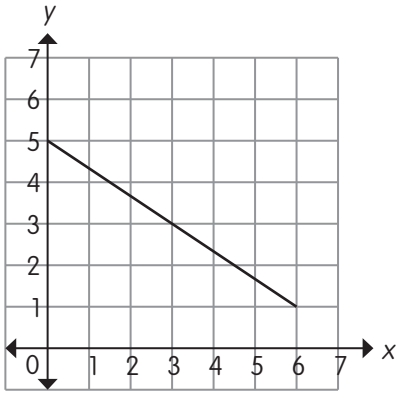
(A)



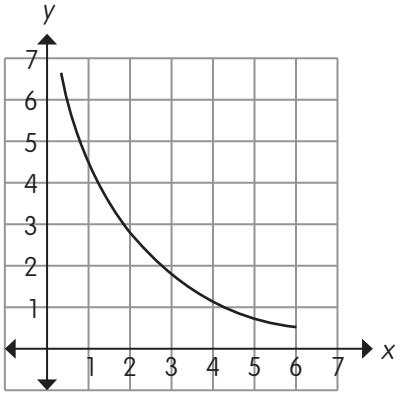
(B)



(C)



(D)



Section B Short Answer Questions

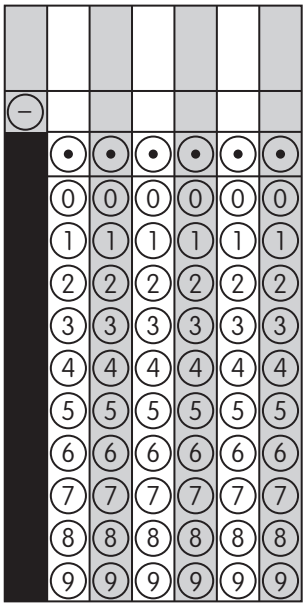
(11 to 20: 2 points each)

11 Solve the equation $\frac{1}{3}x - \frac{1}{4} = \frac{1}{6}$.

Write your answer in the space below.

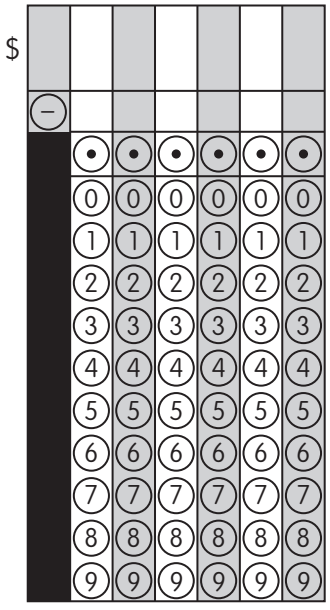
12 Solve the equation $2.1(2a - 1) + 1.5 - 3.6a = 0$.

Write your answer in the answer grid.



13 A bagel and a cup of coffee cost \$5. The bagel costs \$1.60 less than the cup of coffee. How much does the cup of coffee cost?

Write your answer in the answer grid.



14 Solve the inequality $4x - 3 \geq 9$, and graph the solution set on a number line.

Show your answer and drawing in the space below.

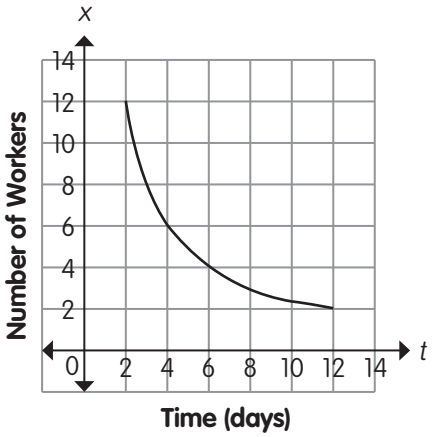
15 The yearly assessment for science is the average score of 5 tests. Lola scored 57, 66, and 70 for her first 3 tests. What is the minimum average score she must get for the last 2 tests for Lola to get at least 70 for her yearly assessment?

Write your answer and your work or explanation in the space below.

16 The area of a right triangle is 13 square feet. The height in feet, h, of the triangle is inversely proportional to its base in feet, b. Find an inverse proportion equation to show this relationship.

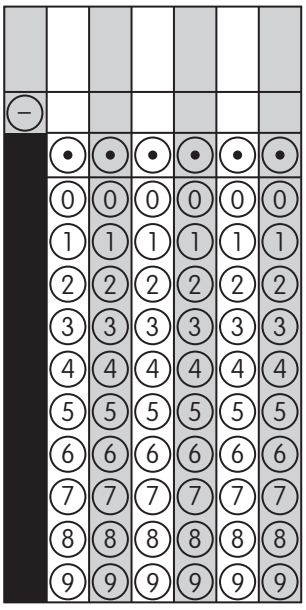
Write your answer in the space below.

17 The number of workers to repair a ship is inversely proportional to the number of days to complete the task. The graph below shows the time in days, t, it takes x workers to repair the ship.



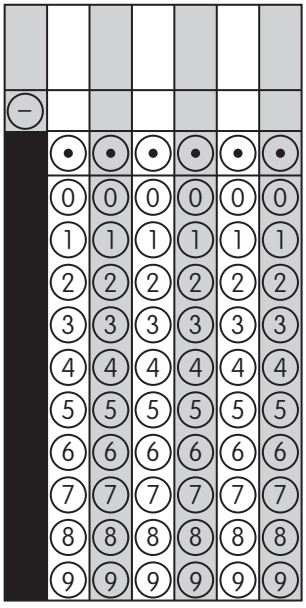
How many workers are needed to repair the ship in 4 days?

Write your answer in the answer grid.



18 y is inversely proportional to x, and $y = 6$ when $x = 12$. Find the value of y when $x = 48$.

Write your answer in the answer grid.

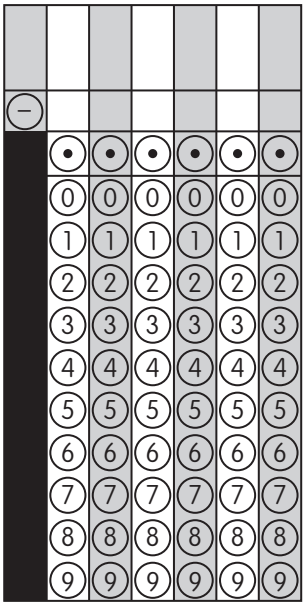


19 A watch priced at $1,200 decreased by 25%, and then increased by 50%. What was the increase in its price?

Explain your answer in the space below.

20 To clear the bagels off the shelves, a baker puts up a sign showing "buy 4 get 1 free".
What is the percent discount?

Write your answer in the answer grid.



Section C Constructed Response

(21: 3 points; 22: 3 points; 23: 4 points)

21 This question has two parts.

Part A

Carla says that the equation $3(5x + 4) = 15x + 12$ has no solution, because $3(5x + 4)$ can be written as $15x + 12$.

Do you agree?

Explain your answer in the space below.

Part B

Carson says that the solution of the equation $3(5x + 4) = 57$ is $\frac{23}{5}$. The steps below show how he worked out the answer.

$3(5x + 4) = 57$

$15x + 12 = 57$

$15x = 12 + 57$

$15x = 69$

$x = \frac{69}{15}$

$= \frac{23}{5}$

- Identify the mistake Carson made in his work.
- Solve $3(5x + 4) = 57$ for x.

Show your work and answer in the space below.

22 Avery, Brooke, Caden, and Dominic collected some pebbles.

- Avery collected d pebbles.
- Avery collected 10 pebbles fewer than Brooke.
- Caden collected four times as many pebbles as Brooke.
- Dominic collected $(d + 3)$ pebbles.

The total number of pebbles collected by the four children does not exceed 88. What are the possible values of d?

Write your answer and your work or explanation in the space below.

23 This question has two parts.

Grapes are sold at different prices in three stores as shown.

Happy Fruit Shop	Vitamin C Home	Super Fruit
$2.80 per pound	$2 per 8 ounces	$1.60 per 6 ounces

Part A
Which store offers the best deal?

Explain your answer in the space below.

Part B
Grapes at the Happy Fruit Shop are sold at 25% discount. Mr. Martin buys $(x + 0.5)$ pounds of grapes from the shop. If he pays $5.25 for the grapes, form an equation in x and solve it for x.

Write your answer and your work or explanation in the space below.

Name: _____ Date: _____

Assessment Guide
Cumulative Review 3

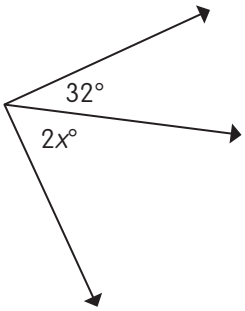
50

Suggested Time: 45 min

Section A Multiple-Choice Questions

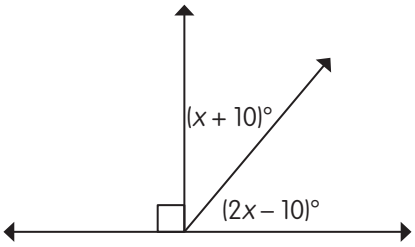
(10 × 2 = 20 points)

1 The diagram shows a pair of complementary angles. What is the value of x?



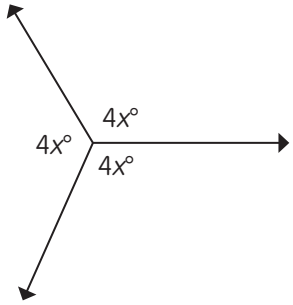
(A) 29
(B) 58
(C) 64
(D) 122

2 What is the value of x?



(A) 10
(B) 20
(C) 30
(D) 40

3 What is the value of x?



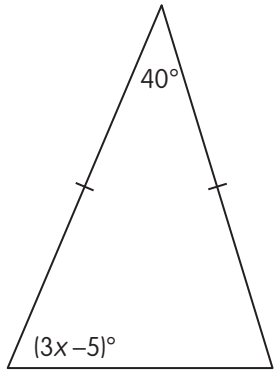
(A) 20

(B) 30

(C) 40

(D) 50

4 What is the value of x?



(A) $16\frac{2}{3}$

(B) $21\frac{2}{3}$

(C) 25

(D) 30

5 Which set of information allows you to draw two possible triangles?

(A) $XY = 13$ cm, $YZ = 10$ cm, and $XZ = 2$ cm

(B) $XY = 10$ cm, $YZ = 24$ cm, and $XZ = 26$ cm

(C) $XY = 10$ cm, $m\angle X = 40°$, and $m\angle Y = 50°$

(D) $XY = 4$ cm, $m\angle X = 60°$, and $YZ = 3.7$ cm

6 A model of the Empire State building measures 7.6 cm tall. It is molded in plastic on a scale of 1 : 5,000. What is the actual height in meters of the building?

(A) 152

(B) 190

(C) 380

(D) 570

7 A park has an area of 49 square centimeters on a map of scale 1 : 20,000. What is its actual area in square kilometers?

(A) 98

(B) 1.4

(C) 9.8

(D) 1.96

8 A circle has a circumference of 72π centimeters. What is its radius in centimeters?

(A) 72

(B) 36

(C) 18

(D) 9

9 Luke measured that the distance around a circular pond is 100π feet. What is its area in square feet?

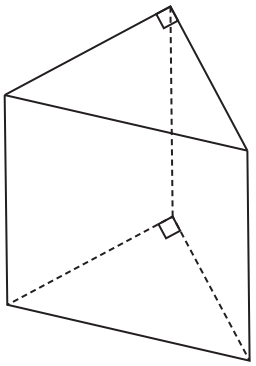
(A) 100π

(B) 200π

(C) $2{,}500\pi$

(D) $10{,}000\pi$

10 Which is the shape of the cross section of the prism shown?



(A) Square

(B) Parallelogram

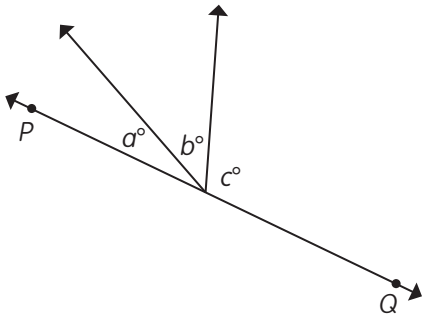
(C) Triangle

(D) Rectangle

Section B Short Answer Questions

(11 to 20: 2 points each)

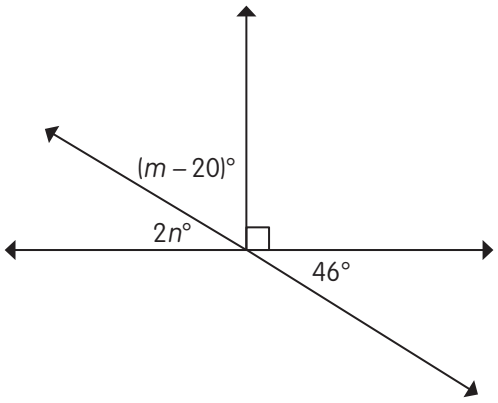
11 In the diagram, $\overleftrightarrow{PQ}$ is a straight line and the ratio $a : b : c = 1 : 2 : 5$.



Find the values of a, b, and c.

Write your answers in the space below.

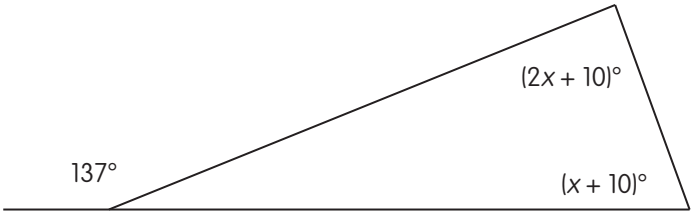
12



Which would you solve for first, *m* or *n*?

Explain how you worked out the values of *m* and *n* in the space below.

13



What is the value of x?

Write your answer in the answer grid.

	⊖					
	⊙	⊙	⊙	⊙	⊙	⊙
	0	0	0	0	0	0
	1	1	1	1	1	1
	2	2	2	2	2	2
	3	3	3	3	3	3
	4	4	4	4	4	4
	5	5	5	5	5	5
	6	6	6	6	6	6
	7	7	7	7	7	7
	8	8	8	8	8	8
	9	9	9	9	9	9

14 A lake was drawn on two different maps. Map A has a scale of 1 cm : 500 m. Map B has a scale of 1 : 80,000. Evan says that the area of the lake on Map A is 2.56 times its area on Map B.

Do you agree?

Explain your answer in the space below.

15 The area of a garden is 100 square meters. It measures 4 square centimeters on a floor plan. What is the scale factor of the floor plan?

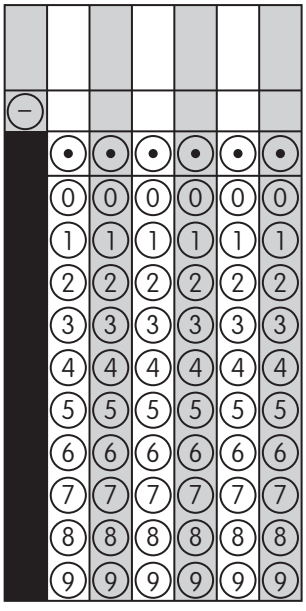
Write your answer in the space below.

16 The curved surface areas of a concrete dome and its model are 162 square meters and 18 square centimeters respectively. What is the diameter in meters of the actual dome if the diameter of the model is 2.4 centimeters?

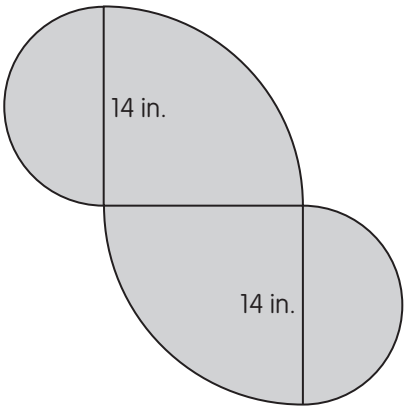
Write your answer and your work or explanation in the space below.

17 The diameter of a bicycle wheel is 20 inches. What is the distance covered in inches by the wheel after it has made 7 revolutions? Use $\frac{22}{7}$ as an approximation for π.

Write your answer in the answer grid.



18 The shape of a rug is made up of two semicircles of diameter 14 inches and two quadrants as shown.

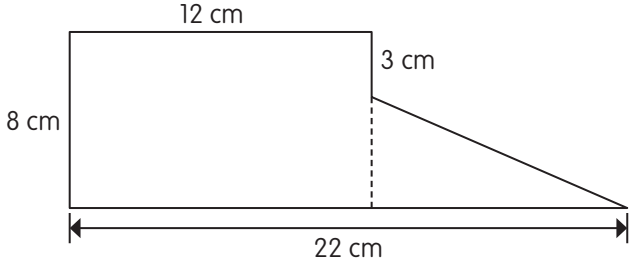


What is the area in square inches of the rug? Use $\frac{22}{7}$ as an approximation for π.

Write your answer in the answer grid.

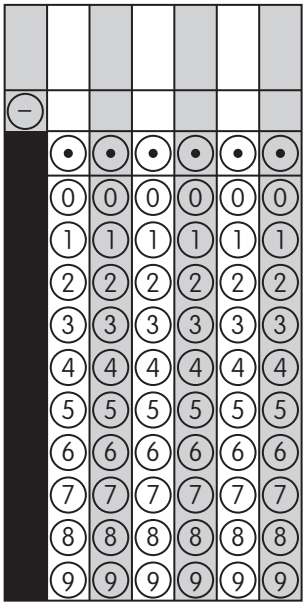
−						
	•	•	•	•	•	•
	0	0	0	0	0	0
	1	1	1	1	1	1
	2	2	2	2	2	2
	3	3	3	3	3	3
	4	4	4	4	4	4
	5	5	5	5	5	5
	6	6	6	6	6	6
	7	7	7	7	7	7
	8	8	8	8	8	8
	9	9	9	9	9	9

19 This figure is made up of a rectangle and a triangle.

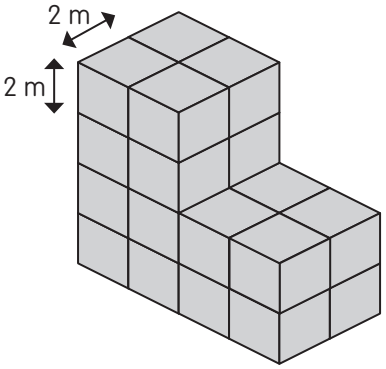


What is its area in square centimeters?

Write your answer in the answer grid.



20 Cubes of side 2 meters are stacked to form an L-shaped solid as shown.



What is the volume in cubic meters of the solid?

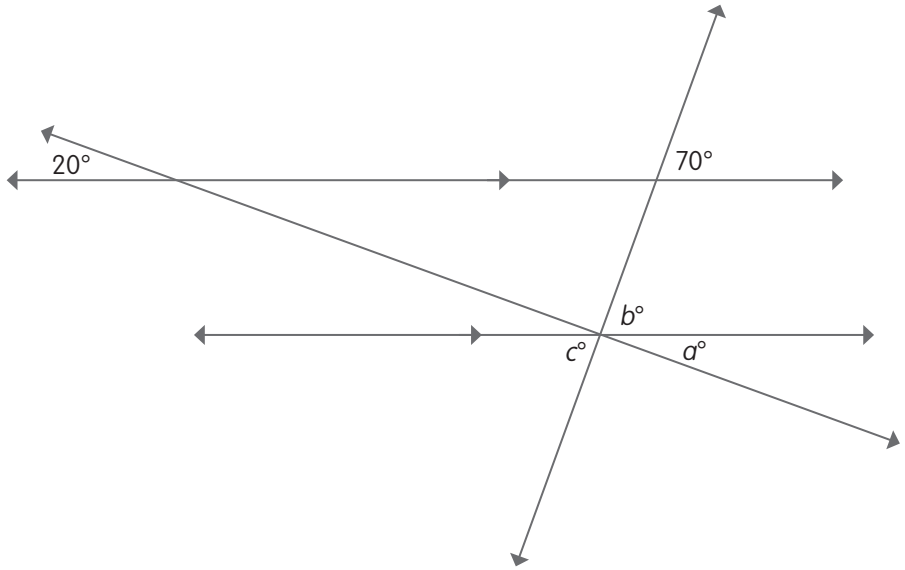
Write your answer in the answer grid.

−						
	⊙	⊙	⊙	⊙	⊙	⊙
	0	0	0	0	0	0
	1	1	1	1	1	1
	2	2	2	2	2	2
	3	3	3	3	3	3
	4	4	4	4	4	4
	5	5	5	5	5	5
	6	6	6	6	6	6
	7	7	7	7	7	7
	8	8	8	8	8	8
	9	9	9	9	9	9

Section C Constructed Response

(21: 3 points; 22: 3 points; 23: 4 points)

21 This question has two parts.



Part A

Explain why angles $a°$ and $b°$ are complementary angles.

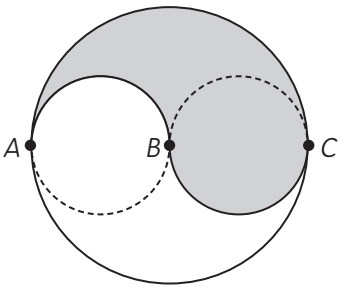
Show your explanation in the space below.

Part B
If $a = x + 8$ and $b = 2x - 20$, what is the value of c?

Write your answer and your work or explanation in the space below.

22 This question has two parts.

Part A
In the figure below, point B is the center of the largest circle of radius r meters.

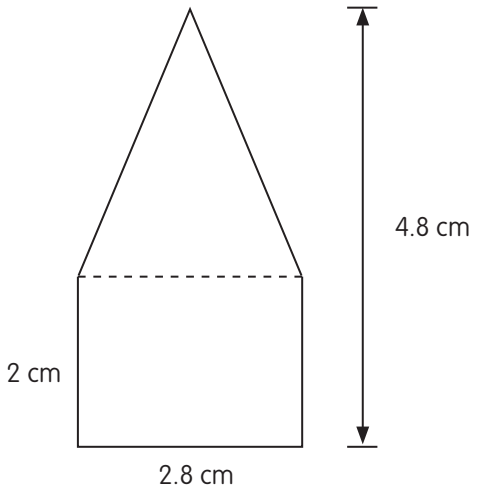


Explain why the area of the shaded region is half the area of the largest circle.

Show your explanation in the space below.

Part B

A rectangular block of gold measuring 4 cm by 6 cm by 8 cm is melted and cast into pendants. Each pendant is 0.2 cm thick, and its cross section is formed by an isosceles triangle and a rectangle with dimensions shown below.

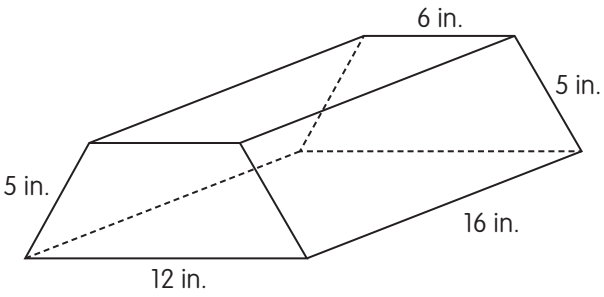


There is a loss of 2% in volume due to melting and casting. How many pendants can be made from the rectangular block of gold?

Write your answer and your work or explanation in the space below.

23 This question has two parts.

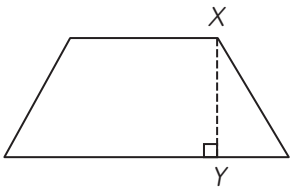
An open container is a trapezoidal prism with dimensions shown below.



Part A

The container can hold at most a volume of 576 cubic inches. What is the height in inches, *XY* of the trapezoidal prism?

Write your answer and your work or explanation in the space below.



Part B

Thomas filled the container with sand to a height of 2 inches. The sand had a volume of 336 cubic inches. Find the area of the sand that was not in contact with the container.

Write your answer and your work or explanation in the space below.

Name: _____ Date: _____

Assessment Guide
Cumulative Review 4

50

Suggested Time: 45 min

Section A Multiple-Choice Questions

(10 × 2 = 20 points)

1. Adam, a high school teacher, wants to find out the favorite subjects of students in his school. He knows that the names of all the students have been stored into a computer database. So, he writes a computer program that will randomly select 30 names from each level. Then, he contacts these students for his survey.
Which sampling method does Adam use?

   (A) Simple random sampling

   (B) Stratified random sampling

   (C) Systematic random sampling

   (D) None of the above

2. Which statement about a population and a sample is **not** true?

   (A) A sample is a subset of a population.

   (B) A size of a sample is always small and the size of a population is always big.

   (C) The size of a sample is smaller than the size of a population.

   (D) We use a sample to draw inferences about the population we study.

3. If *A* is the event of picking 3 letters randomly from the word "METAL", which are the possible outcomes?
Choose **all** that apply.

   (A) M, E, L

   (B) M, A, N

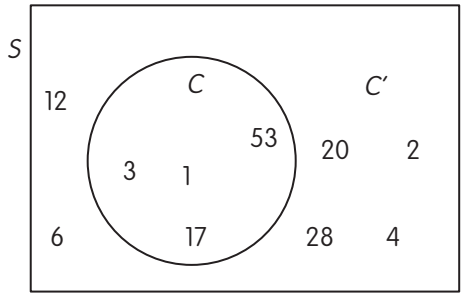
   (C) A, N, T

   (D) F, A, T

   (E) E, A, T

   (F) L, E, T

4 What is the probability of event C in the Venn diagram shown?



A $\frac{1}{2}$

B $\frac{2}{3}$

C $\frac{3}{5}$

D $\frac{2}{5}$

5 A bag contains 8 black, 3 green, 10 yellow, and 9 red balls. What is the probability of getting a yellow ball from the bag?

A $\frac{4}{15}$

B $\frac{1}{3}$

C $\frac{3}{10}$

D $\frac{1}{10}$

6 Lily is busy doing homework at home. Her favorite two-hour TV show starts soon.

What are the possible outcomes for Lily?

(A) Misses the TV show, has done her homework

(B) Misses the TV show, has not done her homework

(C) Does not miss the TV show, has done her homework

(D) Does not miss the TV show, has not done her homework

(E) Misses the TV show, is not at home

(F) Has done her homework, is not at home

7 Which statements are correct?

Choose **all** that apply.

(A) Selecting the letter "Y" from the word "HAPPY" is a compound event.

(B) Selecting a red bead from a box and then a purple marble from a bag is a simple event.

(C) Drawing two dimes with replacement from a purse is a compound event.

(D) Choosing a pair of pants from a wardrobe is a simple event.

(E) Spinning a spinner that is divided into six numbered sections to get an even number or a number greater than 3 is a compound event.

(F) Rolling 3 fair six-sided number dice to get a sum of 12 is a compound event.

8 Ivanna scored 56, 65, 71, 68, and 75 in 5 math tests. Kevin scored 76, 71, 55, 79, and 79 in the 5 math tests. Which statements about their performance are true?

Choose **all** that apply.

(A) Ivanna's scores have a smaller range than Kevin's scores.

(B) Kevin scored better than Ivanna in general.

(C) Ivanna has a more consistent performance than Kevin.

(D) Kevin has a lower MAD to mean ratio than Ivanna.

(E) Ivanna has a higher median score than Kevin.

9 A basket has 3 green and 12 red apples. Luna wants to make apple pies. She takes 2 apples from the basket, one after another, without replacement. What is the probability that both apples are red?

(A) $\frac{12}{15} \times \frac{11}{15}$

(B) $\frac{12}{15} \times \frac{12}{15}$

(C) $\frac{12}{15} \times \frac{11}{14}$

(D) $\frac{12}{15} \times \frac{12}{14}$

10 Which are dependent events?

Choose **all** that apply.

(A) Grace attending a piano lesson on Monday and a drama course on Tuesday

(B) Pedro and Abigail jogging in the park on a sunny day

(C) Aidan attending a concert and getting overtime at work on the same day

(D) Owen parking illegally and getting a parking ticket

(E) Jessica drawing a picture and listening to music

Section B Short Answer Questions

(11 to 15 Part A, 15 Part B, 16 to 19: 2 points each)

11 A spinner is divided into four sections numbered 1 to 4. The spinner is spun once. The table below shows the probability of each outcome.

Outcome	1	2	3	4
Probability	x	y	y	y

It is twice as likely to get the number 1 than any other number. What are the values of x and y?

Explain your answers in the space below.

12 A random sample of 6 students' masses in kilograms is shown.

42, 38, 40, 50, 54, 46

- Find the sample mean.
- Estimate the population mean.

Write your answers in the space below.

13 Mr. Lee has 3 children. The eldest is a daughter. What are the possible combinations of his children?

Using the letter "B" to represent a boy and the letter "G" to represent a girl, write your answer in the space below.

14 In an orchard, 40% of the trees are apple trees, 50% of the remaining trees are oranges, and the rest are peaches. What is the probability of randomly choosing a peach tree from the orchard?

Explain your answer in the space below.

15 This question has two parts.

A die is tossed 300 times. Its observed frequencies and experimental frequencies for some outcomes are tabulated.

Outcome	1	2	3	4	5	6
Observed Frequency	48	53	52	47	51	
Experimental Frequency	50			50		50

Part A

- Write each missing value in the table.
- Explain whether the die is fair or not in the space below.

Part B

- What are the experimental and theoretical probabilities of getting the number 1?
- Are the two probabilities close to each other? Explain why.

Write your answers and explanation in the space below.

16 Claire rolled two fair six-sided dice and jotted down the numbers facing up. Then, she calculated the absolute difference between the pair of numbers. The table below shows some of the outcomes.

Die 2 \ Die 1	1	2	3	4	5	6
1	0	1	2	3	4	5
2		0	1		3	
3	2	1		1		3
4		2	1		1	
5		3			0	
6		4				0

- Write each missing outcome in the table above.
- Write the outcome that has the highest frequency in the space below.

17 There are 3 black ties and 3 white ties in a drawer. Carter randomly picks a tie and replaces it. Then, he randomly picks another tie from the drawer. What is the probability of picking 2 ties of different color?

Write your answer and your work or explanation in the space below.

18 There are 5 dimes and 4 nickels in a purse. 2 coins are drawn randomly from the purse, without replacement. What is the probability of drawing 2 different types of coins?

Write your answer and your work or explanation in the space below.

19 There are 4 black socks and 2 white socks in a bag. 2 socks are picked randomly from the bag, without replacement. The probability of picking 2 black socks is $\frac{x+1}{10}$. What is the value of x?

Write your answer and your work or explanation in the space below.

Section C Constructed Response

(20: 3 points; 21: 3 points 22: 4 points)

20 Jack has 2 pairs of black shoes and 1 pair of white shoes in his wardrobe. He randomly picks a shoe without looking. Then, he randomly picks another shoe to make a pair of shoes for him to wear to work. Jack says that since 2 out of 3 pairs of shoes are black, the probability of getting a pair of black shoes is $\frac{2}{3}$.

- Explain the mistake in Jack's reasoning.
- Find the probability of picking a pair of black shoes.
- Explain how you found the answer.

Show your explanations and answer in the space below.

21 This question has two parts.

Ms. Thompson asked her class of students how many pets they have at home. The table below shows the results of the survey.

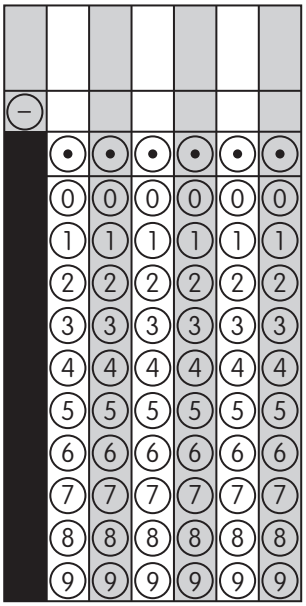
Number of Pets	0	1	2	3	4	5
Relative Frequency	0.3	0.25	0.1	0.05	0.1	0.2

In the school, there are 560 students.

Part A

Predict the number of students in the school that have more than 2 pets.

Write your answer in the answer grid.



Part B
Predict the total number of pets that the students in the school have.

Explain your answer in the space below.

22 There are 2 blue balls and 3 red balls in a box. A ball is picked and its color is noted. If it is blue, it will be returned to the box. If it is red, it will be placed aside. Another ball is picked and its color is noted. What is the probability of picking 2 balls of the same color?

Write your answer and your work or explanation in the space below.