

Assessment Guide

End-of-Year Benchmark Assessment

100

Suggested Time:
90 min

Section A Multiple-Choice Questions

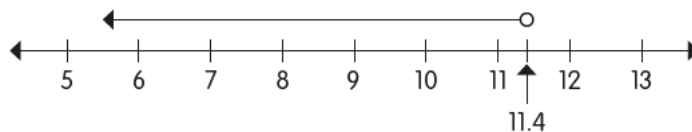
(20 × 2 = 40 points)

- 1 These five numbers are plotted on a horizontal number line.
-5, 7, -13, 2, -18

Which statement about the locations on the number line of the numbers is true?

- (A) -5 is farthest to the left, and 2 is farthest to the right.
- (B) -18 is farthest to the left, and 2 is farthest to the right.
- (C) -5 is farthest to the left, and 7 is farthest to the right.
- (D) -18 is farthest to the left, and 7 is farthest to the right.

- 2 Which inequality represents the number line shown?



- (A) $x > 11.4$
 - (B) $x \geq 11.4$
 - (C) $x < 11.4$
 - (D) $x \leq 11.4$
- 3 During a sale, all blankets are sold at $\frac{4}{5}$ of the regular price. Jade bought 3 blankets during the sale. Which expression shows the amount of money she saved on the blankets that had a regular price of q dollars each?
- (A) $3q \times 5$
 - (B) $3q \div 5$
 - (C) $3q + 5$
 - (D) $3q - 5$

- 4 A rectangular plot of land has an area of $\frac{2}{9}$ square kilometer. Its length is $\frac{5}{8}$ kilometer. What is the width in kilometers of the plot of land?
- (A) $\frac{61}{72}$
- (B) $\frac{16}{45}$
- (C) $\frac{5}{36}$
- (D) $2\frac{13}{16}$
- 5 Which pairs of expressions are equivalent?
Choose **all** that apply.
- (A) $4g - 11$ and $3g - 20 + g + 9$
- (B) $h + h + h + h + h + h + h$ and $h + 7$
- (C) $2j - 5$ and $5 - 2j$
- (D) $6k + 10k$ and $\frac{48k}{3}$
- (E) $5(m + 4)$ and $4(5 + m)$
- 6 Michael has 35 mystery novels. This is $\frac{7}{12}$ of his novel collection. Which equation can be used to determine y , the number of novels that Michael has?
- (A) $\frac{5y}{12} = 35$
- (B) $\frac{5}{12y} = 35$
- (C) $\frac{7y}{12} = 35$
- (D) $\frac{7}{12y} = 35$

- 7 Chase has $(4x + 9)$ five-dollar bills and Riley has $(6x - 1)$ ten-dollar bills. How much do Chase and Riley have in all?
- (A) $(10x + 8)$ dollars
- (B) $(70x + 35)$ dollars
- (C) $(80x + 35)$ dollars
- (D) $(150x + 120)$ dollars

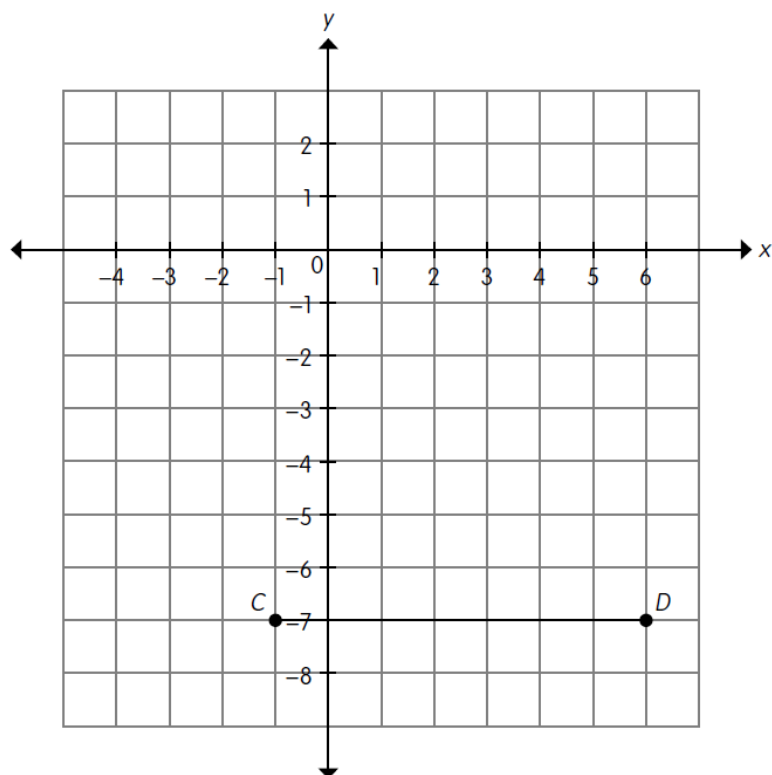
- 8 The table shows the fees at a parking space.

First 3 Hours	\$4
Every Subsequent $\frac{1}{2}$ Hour or Part of $\frac{1}{2}$ Hour	\$2.50

James parked his car from 2 P.M. to 8:30 P.M. on the same day. How much did he pay for parking?

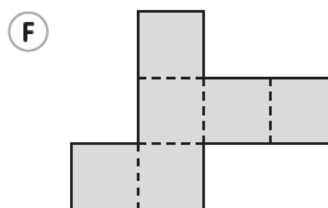
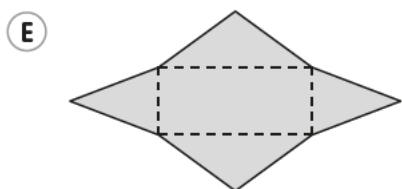
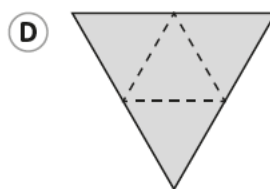
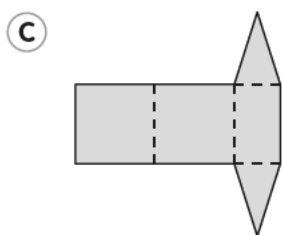
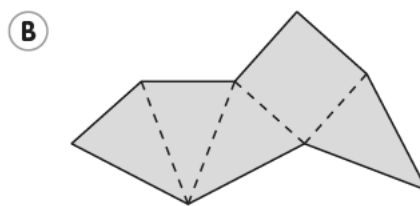
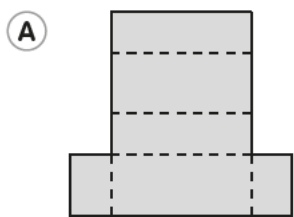
- (A) \$21.50
- (B) \$19.50
- (C) \$14.00
- (D) \$11.50
- 9 Sofia wants to draw a hexagon $PQRSTU$ with center $O(3, 1)$. She has plotted the points $P(1, 4)$, $Q(-1, 1)$, $R(1, -2)$, $T(7, 1)$, and $U(5, 4)$ on a coordinate plane. At which location of the coordinate plane should she plot point S ?
- (A) $(3, 1)$
- (B) $(5, -2)$
- (C) $(6, -3)$
- (D) $(9, 0)$

- What is the length of the line segment $\overline{CD}$?

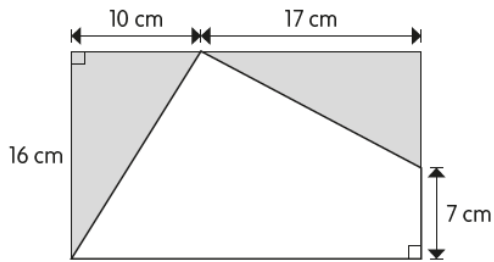


- Ⓐ 5 units
- Ⓑ 6 units
- Ⓒ 7 units
- Ⓓ 8 units

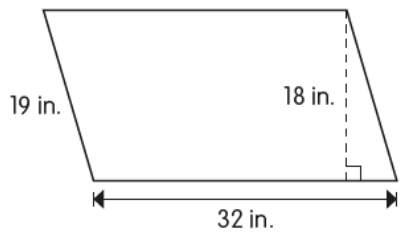
- 11 Which is a net of a pyramid?
Choose **all** that apply.



- 12 What is the shaded area in square centimeters?

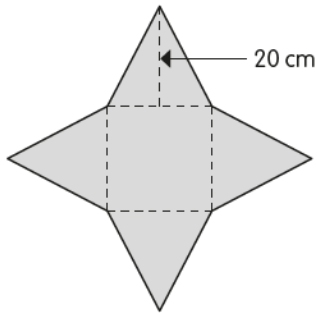


- (A) 139.5
(B) 156.5
(C) 216
(D) 275.5
- 13 What is the area in square inches of the parallelogram shown?



- (A) 608
(B) 592
(C) 576
(D) 342

- 14 A square pyramid has a base area of 324 square centimeters. The height of each triangular face of the pyramid is 20 centimeters. What is the surface area in square centimeters of the pyramid?



- (A) 1,044
(B) 720
(C) 684
(D) 504
- 15 The volume of a rectangular prism is 1,296 cubic inches. It has a square base with edges that are 9 inches long. What is the surface area in square inches of the prism?
- (A) 864
(B) 738
(C) 612
(D) 576

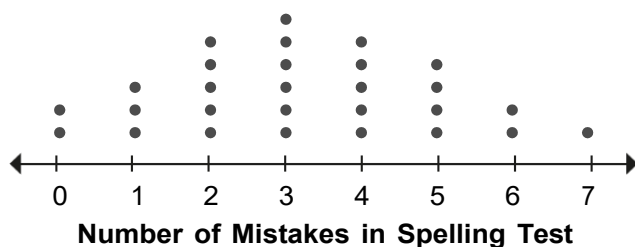
16 A data set has seven numbers. The first six numbers total 49.8. Given that the mean of the data set is 9.1, what is the seventh number?

- (A) 3.5
- (B) 5.6
- (C) 13.1
- (D) 13.9

17 The data set shows the time taken in seconds by a group of children to swim 50 meters. 48.1, 37.4, 55.0, 41.6, 39.7, 60.9, 62.8, 59.5, 47.2, 54.6
What is the range of the data set?

- (A) 25.4
- (B) 23.5
- (C) 21.2
- (D) 6.5

- 18 The dot plot shows the number of mistakes students made in a spelling test.

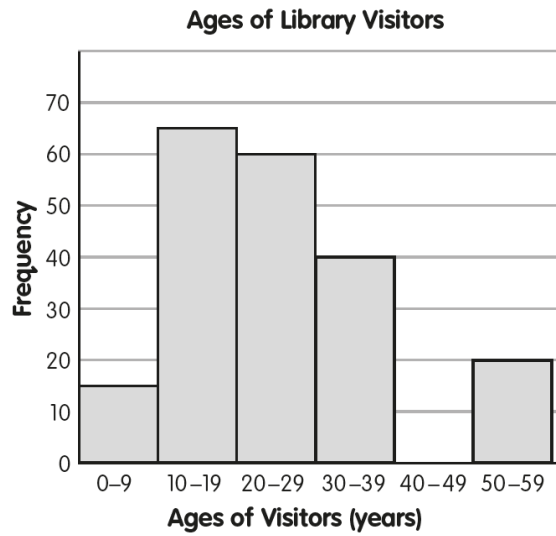


Which statements are true?

Choose **all** that apply.

- ☐ A The dot plot is symmetrical.
- ☐ B The range of the data is 7.
- ☐ C 26 students sat for the spelling test.
- ☐ D Most of the data values are from 4 to 7.
- ☐ E More than 45% of the students made more than 3 mistakes.
- ☐ F $17\frac{6}{7}\%$ of the students made either 0 or 1 mistake.

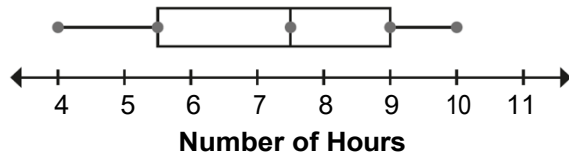
- 19 The histogram shows the ages of people who visited a library on a particular day.



How many more library visitors are 20 to 29 years old than 0 to 9 years old?

- ☐ A 75
- ☐ B 50
- ☐ C 45
- ☐ D 25

- 20 A group of 40 adults was surveyed to find out how many hours they sleep every day.



Which statements are true?

Choose **all** that apply.

- ☐ A The range is 7 hours.
- ☐ B 50% of the adults surveyed sleep 7.5 hours every day.
- ☐ C 25% of the adults surveyed sleep more than 5.5 hours every day.
- ☐ D 10 adults sleep more than 9 hours every day.
- ☐ E At least one adult sleeps 10 hours every day.

Section B Short Answer Questions

(21 to 38 Part A, 38 Part B,
39: 2 points each)

- 21 Express each ratio in simplest form.

Write each answer in the table.

Ratio 1 86 : 124		
Ratio 2 63 : 35		
Ratio 3 5 kg : 600 g		
Ratio 4 24 cm : 25 m		

- 22 Evaluate each algebraic expression.

Write each answer in the table.

Evaluate	Answer
$2(9c + 5) - \frac{4c + 7}{3}$ when $c = 5$	
$\frac{5k + 1}{6} + \frac{8 - k}{5} - \frac{k}{2}$ when $k = 4$	

- 23 Solve each equation.

Write each solution in the table.

Equation	Solution
$x + \frac{11}{6} = 3\frac{1}{3}$	
$10 \cdot \frac{7}{9} = \frac{7}{12}y$	

- 24 Diego bought a box of p paper clips. 64% of the paper clips are blue and the rest are white. If there are q white paper clips in the box, express q in terms of p .

Write your answer in the space below.

- 25 Express 190 as a product of its prime factors.

Write your answer in the space below.

- 26 The average height of a group of nine boys is $(6r + 5)$ centimeters. Two more boys with heights of $(6r + 11)$ centimeters and $(7r - 5)$ centimeters are added to the group. Find an algebraic expression for the combined height of the 11 boys.

Explain your answer in the space below.

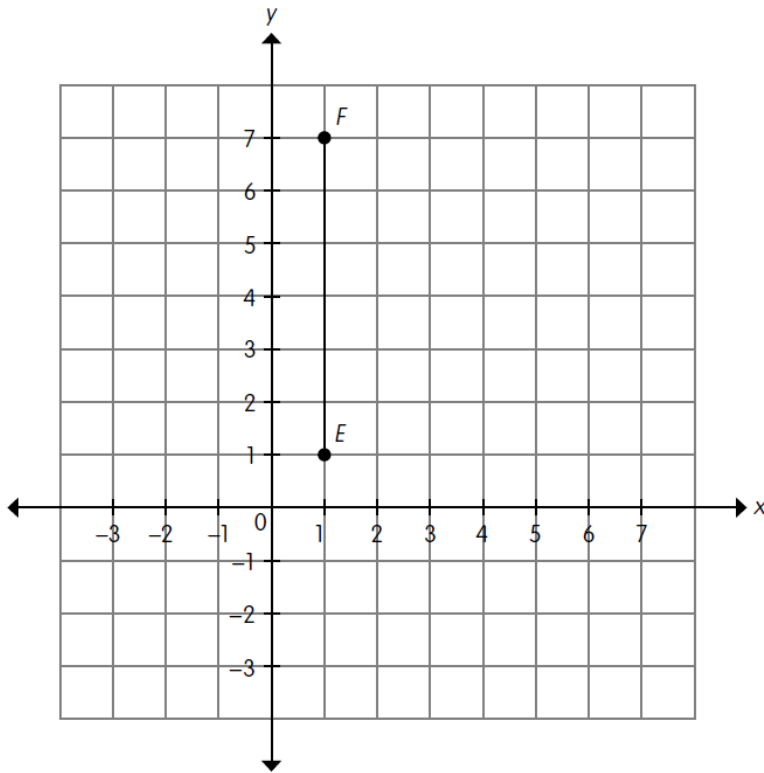
- 27 A bookstore owner ordered 15 boxes of colored files. Each of the boxes contains 40 colored files and more than 55% of them in each box are green. Find the least possible number of green files in all the 15 boxes.

Explain your answer in the space below.

- 28 A shop has stock of 750 keychains. 38% of the keychains are plastic, 60% of the remaining keychains are metallic, and the rest of the keychains are wooden. How many wooden keychains does the shop have?

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

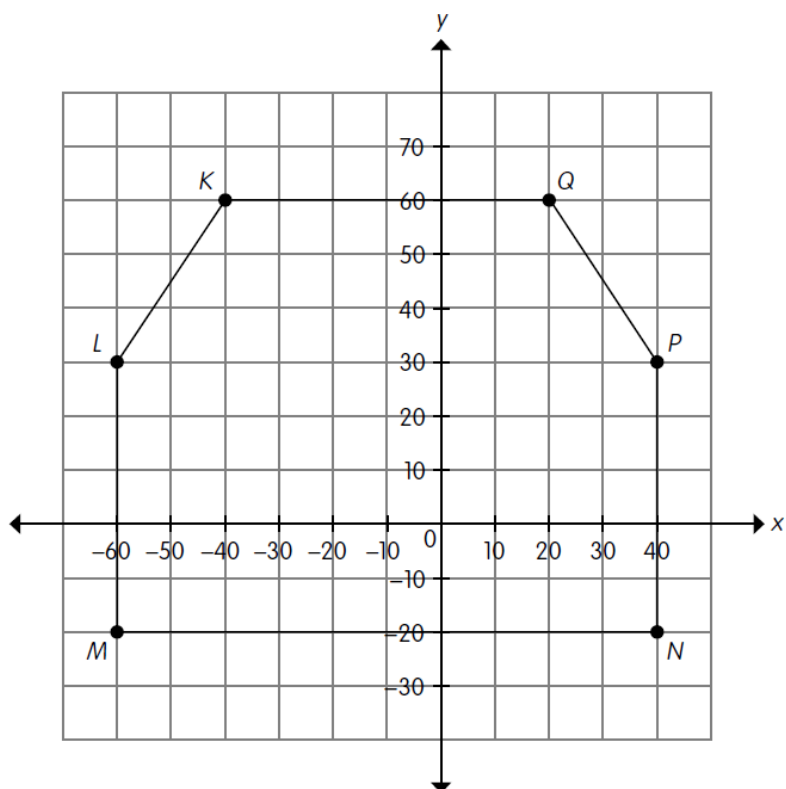
- 29 Logan wants to draw a rectangle $EFGH$ that has a length of 6 units and a width of 4 units. He has drawn the line segment EF as shown.



Name two possible sets of coordinates that could be the coordinates of points G and H .

Write your answers in the space below.

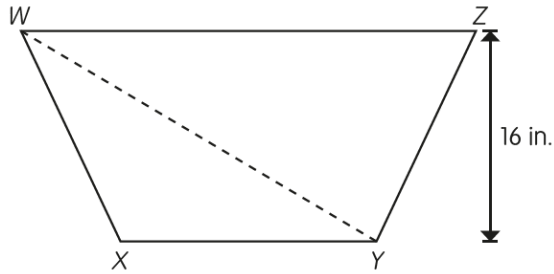
- 30 The diagram shows the outline of a garden. The side length of each grid square is 10 meters.



What is the area of the garden in square meters?

Explain how you found the answer in the space below.

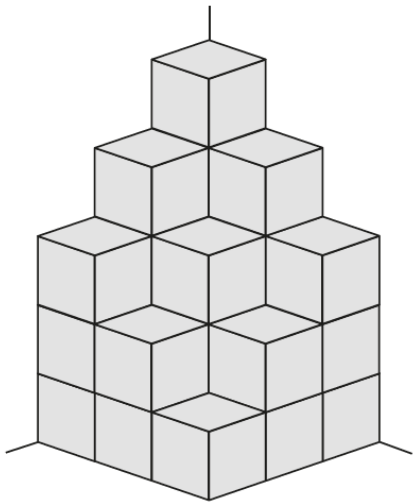
- 31 The area of trapezoid $WXYZ$ is 376 square inches and the area of triangle WXY is 144 square inches. What is the length of $\overline{WZ}$?



Explain the steps you used to find the length of $\overline{WZ}$.

Write your answer and explanation in the space below.

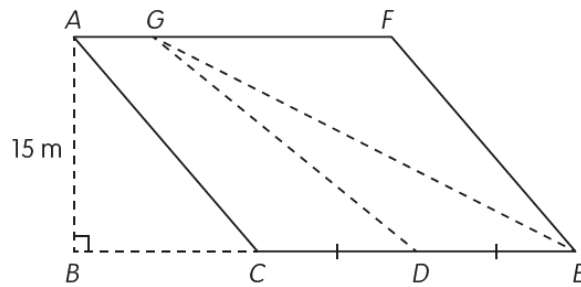
- 32 The solid below is made up of identical cubes, each of which has an edge length of 2 centimeters. What is the volume in cubic centimeters of the solid?



Write your answer in the answer grid.

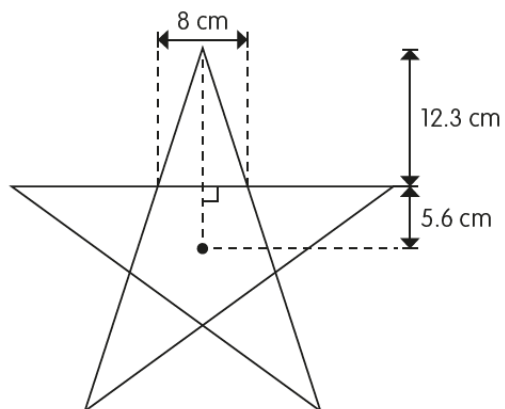
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•	•	•	•	•	•	•
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

- Parallelogram $ACEF$ has an area of 360 square meters. The lengths of $\overline{CD}$ and $\overline{DE}$ are equal. The ratio of $\overline{AG}$ to $\overline{GF}$ is 1 : 3. What is the area of trapezoid $ACDG$?



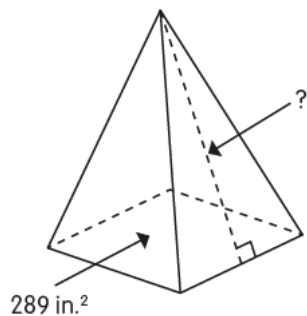
Write your answer and your work or explanation in the space below.

- 34 The figure is made from a regular pentagon surrounded by identical triangles. What is the area of the figure?



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

- 35 A square pyramid has four faces that are congruent isosceles triangles. What is the height in inches of each triangle if the surface area of the pyramid is 663 square inches?



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

- 36 The data set shows the capacity in milliliters of some water bottles.

150	750	500	800	100	1,500
225	500	1,200	600	400	250
1,000	320	750	400	900	1,500
200	1,000	1,500	800	225	100
900	350	1,200	750	600	320

- Group the data into suitable intervals and tabulate them.
- Explain your choice of interval.

Show your table and explanation in the space below.

- 37 The table shows the orders received by an online clothing store for one of their new designs.

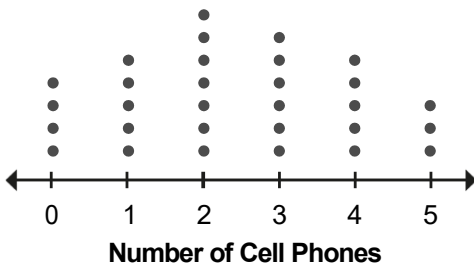
Size of Clothing	34	36	38	40	42	44	46	48
Frequency	2	5	8	6	10	4	7	3

Draw a dot plot to represent the data.

Show your drawing in the space below.

38 This question has two parts.

The dot plot shows the results of a survey on the number of cell phones in 30 randomly chosen families. Each dot represents 1 family.



Part A

What is the mean number of cell phones?

Write your answer in the answer grid.

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

Part B

A similar survey is carried out on another 25 randomly chosen families and the mean number of cell phones is found to be 3. If the two data sets are combined, what will the mean number of cell phones be? Round your answer to the nearest hundredth.

Explain your answer in the space below.

- 39 The table shows the number of servings of vegetables eaten in the past one week by each of 50 students.

Number of Servings	0	1	2	3	4	5	6	7
Number of Students	5	3	8	10	11	7	4	2

- What is the median number of servings of vegetables?
- If two of the students had 4 servings of vegetables instead of 3, how would the median number of servings of vegetables be affected? Explain briefly.

Write your answer and explanation in the space below.

Section C Constructed Response

(5 × 4 = 20 points)

40 This question has two parts.

Adam has $24\frac{1}{5}$ yards of ribbon to wrap presents. He uses $20\frac{3}{5}$ inches on each of 30 big presents and $10\frac{1}{4}$ inches on each of 20 small presents.

Part A

Find the amount of the leftover ribbon after wrapping all the presents.

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

Part B

Adam decides to use the leftover ribbon to make some bows. Each bow uses $\frac{2}{5}$ yard of ribbon.

- How many bows can he make?
- How much ribbon will he have left after making these bows?

Write your answers and your work or explanations in the space below.

- 41 This question has two parts.

Jordan leaves his house on his bike at a speed of 300 meters per minute at 8 A.M. . His sister, Grace, leaves the house on her bike at 8:20 A.M. and tries to catch up with Jordan. Grace rides at a speed of 420 meters per minute.

Part A

At what time will Grace catch up with Jordan?

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

Part B

If both Jordan and Grace continue riding the bike at their usual speed on the same route after Grace has caught up with Jordan, how many kilometers away from Grace will Jordan be after 1 hour 20 minutes?

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

42 This question has two parts.

The length of a fish tank is two times its width. The height of the fish tank is 22 centimeters. The fish tank is filled with water to a height of 18 centimeters. The volume of water in the fish tank is 5,184 cubic centimeters.

Part A

Find the length of the base of the fish tank.

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

Part B

Find the amount of the glass in area that is used to make the bottom and sides of the fish tank.

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

- 43 This question has four parts.

The water in a kettle is heated. Assume that the temperature of the water, q degrees Celsius, after p minutes, is given by $q = 10p + 25$.

Part A

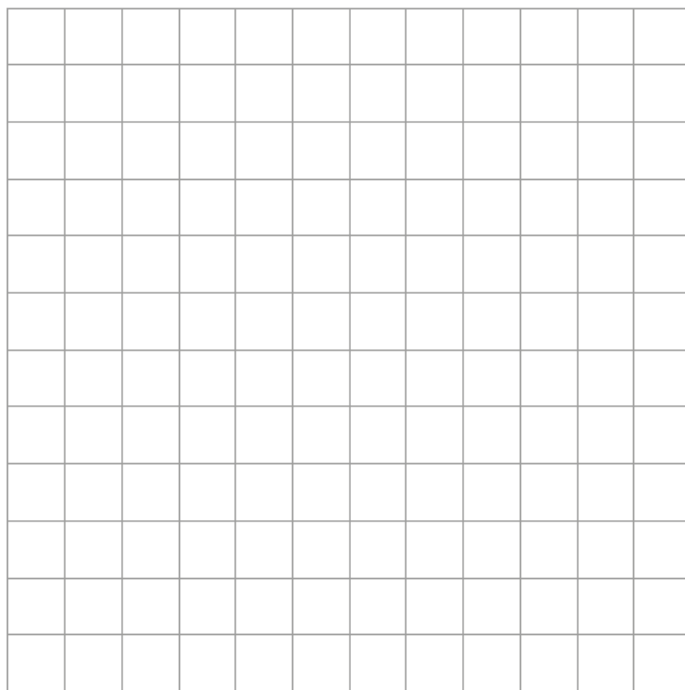
The table below shows some values of p and q .

Write each missing value in the table.

p	0	2	4	6	
q			65		105

Part B

Graph the relationship between q and p . Use 1 unit on the horizontal axis to represent 1 minute and 1 unit on the vertical axis to represent 10 degrees Celsius.



Part C

What is the temperature of the water in degrees Celsius after 3 minutes?

Write your answer in the answer grid.

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

Part D

Avery says that the temperature of the water increases at a rate of 10°C per minute.

Do you agree?

Explain your answer in the space below.

- 44 This question has four parts.

The table shows the lifespan of 60 batteries that were tested.

Battery Life (h)	1–4	5–8	9–12	13–16	17–20	21–24	25–28
Number of Batteries	4	x	12	14	9	$5x$	9

Part A

Find the value of x .

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

Part B

Draw a histogram to represent the data.

Show your drawing in the space below.

Part C

What do you think is the typical lifespan of the batteries?

Explain your answer in the space below.

Part D

What percent of the batteries have a lifespan of more than 12 hours?

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