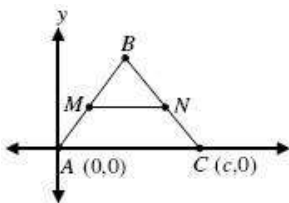1. Which equation of a line is perpendicular to the line given by the equation $y = \frac{2}{3}x - 6$?

   A. $y = -\frac{3}{2}x + 1$ B. $y = -\frac{2}{3}x + 1$

   C. $y = \frac{2}{3}x + 1$ D. $y = \frac{3}{2}x + 1$

2. Which line is parallel to the line $y = 2x + 1$?

    A. $y = -2x + 1$ B. $y = -\frac{x}{2} + 2$

C. $y = 2x + 3$ D. $y = \frac{x}{2} + 4$

3. In the coordinate system below, to prove that segment $\overline{MN}$ is parallel to segment $\overline{AC}$, which of the following must be shown?

A. The length of MN is half the length of $\overline{AC}$.
B. The slope of $\overline{MN}$ equals the slope of $\overline{AC}$.
C. The length of $\overline{AM}$ equals the length of $\overline{MB}$.
D. The length of $\overline{AM}$ equals the length of $\overline{CN}$.

4. In the figure below, the diagonals of parallelogram $ABCD$ intersect at (5, 2).
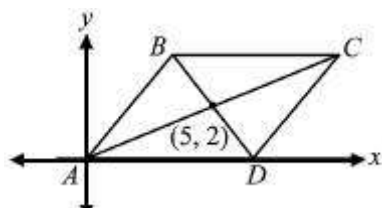
What are the coordinates of point C?

A. (7, 3)   B. (8, 3)   C. (9, 4)   D. (10, 4)

5. **A square has two sides on the lines $x = 3$ and $y = 1$. It has a vertex at (12, -8).**

What is the perimeter, in units, of the square?

A. 18   B. 36   C. 44   D. 52

6. **An electric company chose this design for its new logo.**

What is the sum of the interior angles of the hexagon?

A. 540°   B. 720°
C. 900°   D. 1080°

7. **The measure of one exterior angle of a regular polygon is 24°. What is the sum of its interior angles?**

A. 2340°   B. 2700°   C. 3600°   D. 3960°

8. **The exterior angles of a triangle have a 2:3:4 ratio. What is the smallest exterior angle of the triangle?**

  A. 40°   B. 80°   C. 120°   D. 160°

9.

  These tables show the number of vanilla ice-cream cones and the number of chocolate ice-cream cones sold at an amusement park each day for 12 days.

Vanilla Ice-cream Cones Sold		Chocolate Ice-cream Cones Sold	
Day	Number Sold	Day	Number Sold
1	59	1	59
2	62	2	61
3	67	3	64
4	76	4	73
5	84	5	85
6	91	6	91
7	91	7	92
8	91	8	91
9	86	9	85
10	78	10	75
11	68	11	65
12	59	12	59

  Which statement correctly compares the two data sets?
A. The interquartile range is less for the number of vanilla ice-cream cones sold than for the number of chocolate ice-cream cones sold.
B. The interquartile range is the same for the number of vanilla ice-cream cones sold as it is for the number of chocolate ice-cream cones sold.
C. The mode of the number of vanilla ice-cream cones sold is less than the mode of the number of chocolate ice-cream cones sold.
D. The mode of the number of vanilla ice-cream cones sold is the same as the mode of the number of chocolate ice-cream cones sold.

10. The box-and-whisker plot shown below represents the heights, in inches, of the members of the Central High School girls' basketball team.

Girls' Heights in Inches
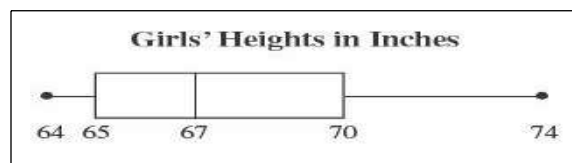
What is the median height of the members of the team?
A. 67 in   B. 68 in   C. 69 in   D. 60 in

11. **Madeline and David take weekly math quizzes. Each quiz has 20 possible points. These data sets show their last five quiz scores.**

> **Madeline: 13, 13, 13, 14, 15**
> **David: 12, 12, 12, 13, 20**

What is the MOST likely reason the mean score for David is greater than the mean score for Madeline?

A. The range of scores for David is greater than the range of scores for Madeline.
B. The median of Madeline's scores is greater than the median of David's scores.
C. The mode of Madeline's scores is greater than the mode of David's scores.
D. The data for David has an outlier that the data for Madeline does not have.

12. **This table shows the gas prices charged at two different stations each day for one week.**

Gas Price Comparison

Day	Fred's Fuel Stop (in dollars)	Gary's Gas Station (in dollars)
Sunday	2.66	2.71
Monday	2.71	2.68
Tuesday	2.72	2.66
Wednesday	2.68	2.64
Thursday	2.64	2.71
Friday	2.62	2.66
Saturday	2.63	2.63

Which statistic has a greater value for Fred's Fuel Stop than for Gary's Gas Station?

A. first quartile
B. median
C. third quartile
D. interquartile range

13. **These lists show the heights, in inches, of 12 players on a basketball team and 12 players on a soccer team.**

 Basketball Players:
 **73, 74, 70, 72, 75, 73, 72, 70, 75, 77, 68, 72**

 Soccer Players:
  68, 70, 69, 71, 73, 72, 75, 70, 71, 68, 70, 69

Which statement BEST explains the variability of the two sets?
A. The heights of the soccer players are more variable because the median of the soccer team is greater.
B. The heights of the basketball players are more variable because the median of the basketball team is greater.
C. The heights of the soccer players are more variable because the interquartile range of the soccer team is greater.
D. The heights of the basketball players are more variable because the interquartile range of the basketball team is greater.

14. **A meteorologist recorded the wind speed and air pressure at different times during a storm in 2002. The data are shown in this graph.**

Air Pressure vs. Wind Speed
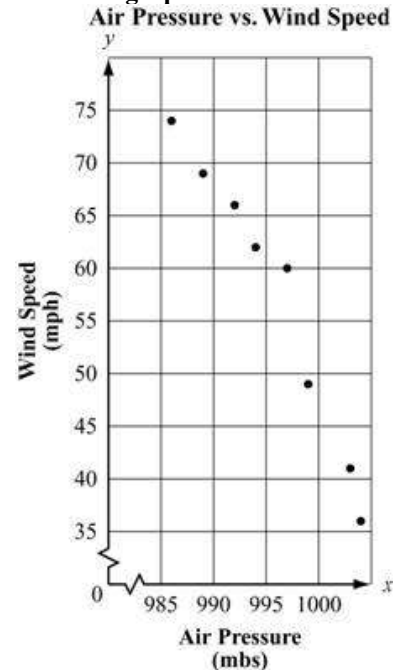
Which linear equation BEST models these data?

A. $y = -1.292x + 1347$
B. $y = -1.435x + 1489$
C. $y = -2.070x + 2118$
D. $y = -3.o99x + 3148$

15. Jenny studied the effect of light on plant growth. She graphed a scatterplot to represent her data.

Effect of Light on Plant Growth
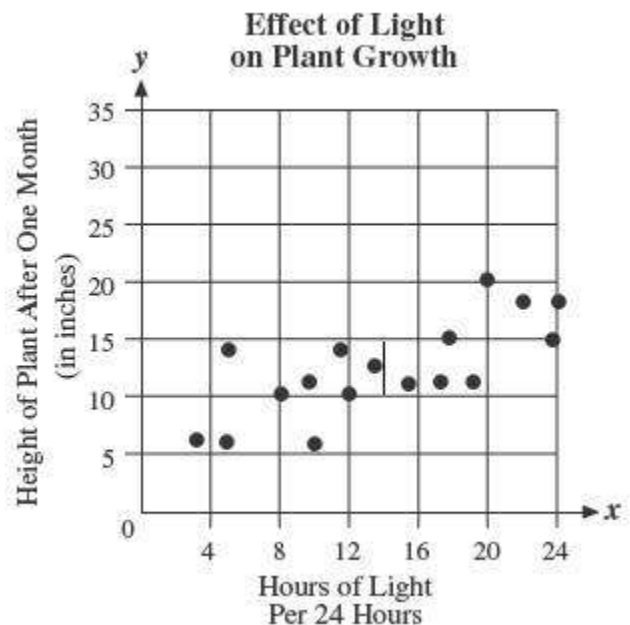
Which of the following **best** represents the equation for the line of best fit for the data shown?

A. $y = -0.4x + 5$
B. $y = 0.4x + 5$
C. $y = -4x + 5$
D. $y = 4x + 5$

16. A delivery service company maintains several vehicles. The table summarizes the cost for auto insurance related to the number of vehicles insured.

Number of Vehicles	Cost ($)
1	1,700
2	2,200
3	2,700
4	3,200
5	3,700
6	4,200

Using the equation of a line of best fit for the data, which is the closest estimate of the total cost of insuring eight vehicles?
A. $5, 050   B. $5,200   C. $5, 500   D. 5,950

17. **This graph shows the number of minutes a student spent bike riding during the past 7 days.**

Minutes Spent Bike Riding

**Which of the following is the domain of the graph?**

A. $0 \le x \le 7$ B. $0 \le x \le 180$
C. $\{30, 60, 90, 120, 150, 180\}$ D. $\{1, 2, 3, 4, 5, 6, 7\}$

18. **A student purchased a car for $15,000. The student expects the value of the car to decrease 20% per year.**

Which function represents the value of the car after n years?

A. $f(n) = 0.2(15,000^x)$ B. $f(n) = 0.8(15,000^x)$

C. $f(n) = 15,000(0.2^x)$ D. $f(n) = 15,000(0.8^x)$

19. **This graph shows the relationship between a touring company's profit and the number of customers on a tour for up to 6 customers.**

Tour Profits
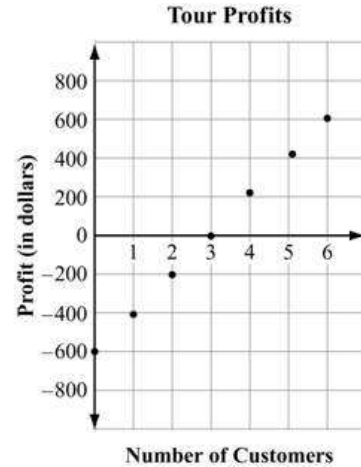
What does the graph's x-intercept represent in this situation?
A. the rate of change of the company's profit
B. the amount of money the company spent on the tour
C. the number of customers needed for the company to break even
D. the number of customers needed for the company to make a profit

20. The scatter plot shows the relationship between the popcorn sales and the bottled water sales for each basketball game.

Popcorn and Bottled Water Sales
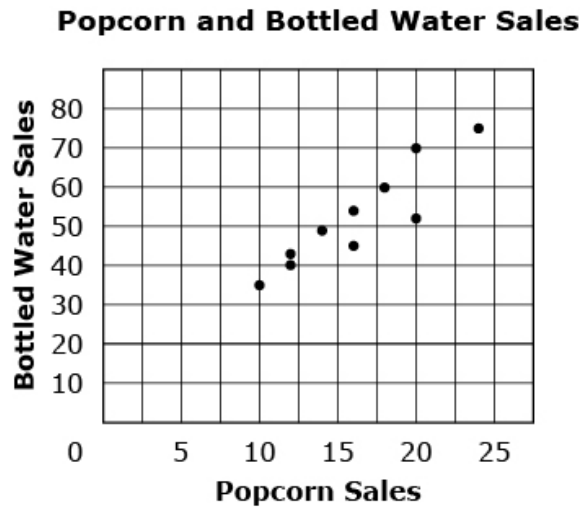
Which statement can be concluded from the data?
A. The data has a weak correlation and demonstrates causation.
B. The data has a strong correlation and demonstrates causation.
C. The data has a weak correlation and does not demonstrate causation.
D. The data has a strong correlation and does not demonstrate causation.

21. Triangles *FGH* and *PQR* are shown.
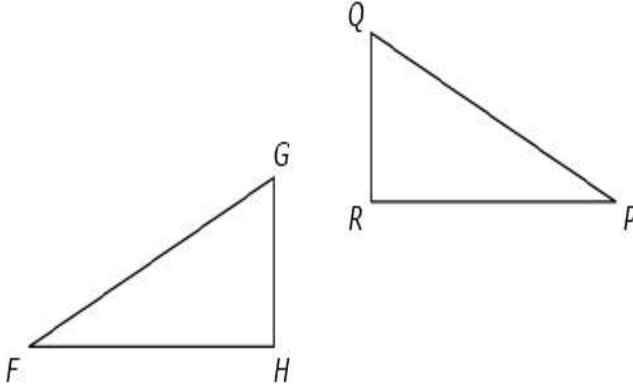
Which sequence of transformations on △*FGH* could result in △*PQR* ?

A. Reflection over a vertical line and translation up
B. Reflection over a horizontal line and translation down
C. Rotation 180 degrees and translation up
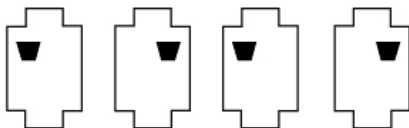D. Rotation 180 degrees and translation down

22. Honmin is creating a graphic design. She draws a white dodecagon with a small gray isosceles trapezoid inside and labels it Figure 1. To complete her design, she performs these three transformations in order on the preceding figure.

- Step 1: Reflection
- Step 2: Rotation
- Step 3: Reflection

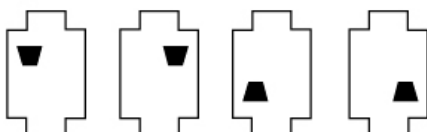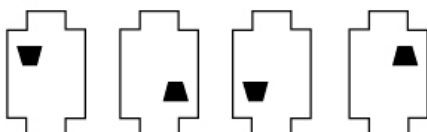Which sequence of figures could be Honmin's design?

A.

B.

C.

*The rest of this review consists of free response questions. The EOCT is all multiple-choice, but these questions will help you think through the problems and processes you need to find the solutions!

23. A vendor sells cotton candy and sodas at baseball games. From past experience, he knows that he must buy at least twice as many sodas as cotton candy. The vendor plans to spend no more than $250 buying both items for the next game.

- He will buy *x* packages of cotton candy at $1.00 per package.
- He will buy *y* sodas at $0.50 per soda.

This graph models the situation. The two lines divide the quadrant into four regions, labeled A, B, C, and D.
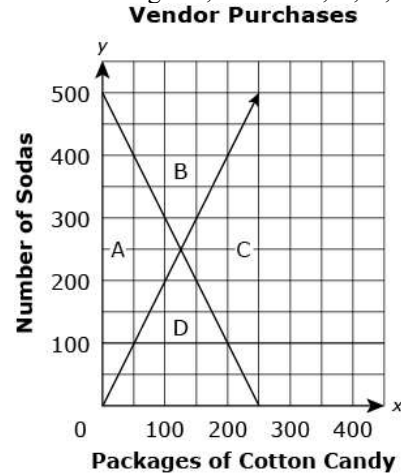
Part A
Write a system of inequalities that represents the graph. Which region represents the solution of the system of inequalities? Show your work or explain your answer.

Part B
The vendor makes a profit of $1.50 on each package of cotton candy sold and $0.50 on each soda. If he sells all the sodas and cotton candy he bought, what is the greatest profit he could make? Show your work or explain your answer.

24. In the formula shown below, *A* is the amount of money in an investment account when *P* dollars are invested at an annual interest rate of *r* for 2 years.
$$A = P(1 + r)^2$$
Part A
What is the amount of money in the account if $2,000 is invested and the annual interest rate is 2.5%? Show your work or explain your answer.
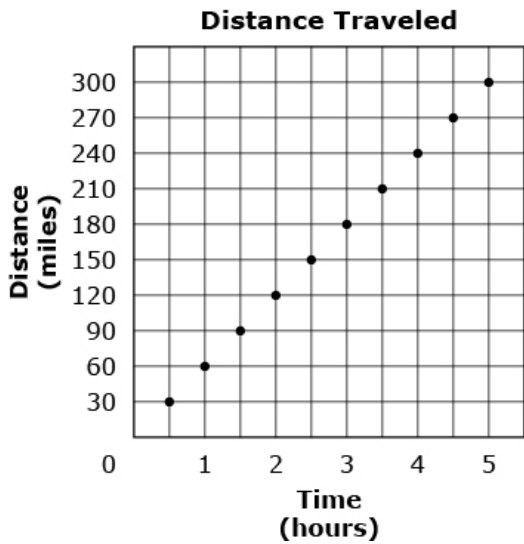
Part B
What is the minimum amount that must be invested at an annual rate of 3% for the amount *A* to equal at least $2,000? Show your work or explain your answer.

Part C
Solve the given equation for *r* . Show your work.

25. The graph shows the distance a car traveled as a function of time.

Distance Traveled

Part A
Calculate the rate of change and interpret its meaning in terms of the context. Show your work and explain your answer.
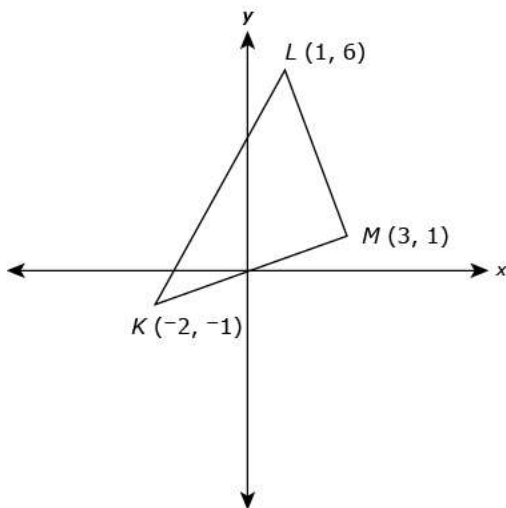
Part B
Use function notation to express four and one-half hours of distance traveled.

Part C
The function $g(x) = 19x$ can be used to model the car's gas mileage, where $g(x)$ represents the total distance in miles and x represents the number of gallons of gas used. What is the value of x when g(x)=133 miles? Show your work.

---

26. The coordinates of the vertices of ΔKLM are shown on a coordinate plane.

Part A
To the nearest tenth of a unit, what is the perimeter of ΔKLM? Show your work.

Part B
Prove that triangle is a ΔKLM right triangle.

Part C
Find the area of ΔKLM. Show your work.

27. The two-way frequency table shows the adoption data for an animal shelter for the first five months of a year.

Adoption Data

	January	February	March	April	May	Total
Cats	20	14	22	34	36	126
Dogs	6	16	16	20	16	74
Total	26	30	38	54	52	200

Part A
What is the difference between the interquartile ranges of the number of cats adopted and the number of dogs adopted during the first five months? Show your work or explain your answer.

Part B
Create a conditional relative frequency table for this data. Explain the values you used in your table.

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28. The table shows the amounts Anita earned for babysitting.

Anita's Babysitting Data

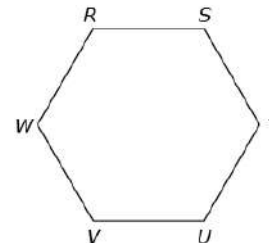| Hours (x)	Amount Earned (y)
2	$15
3	$25
5	$40
7	$55

Part A
A linear model for the data is $y = 7.88135x + 0.25423$. What do the slope and y-intercept of the linear model represent in the context of the given data?

Part B
Analyze the residuals for the data shown in the table. Show your work and explain your answer.

---

29. Figure *RSTUVW* is a regular hexagon.

Part A
List all of the possible lines of reflection for figure *RSTUVW*.

Part B
In terms of degrees, describe 3 rotations that would carry the

figure onto itself. Explain your answer.

30. A car dealer summarizes his business by recording the number of customers who purchased or leased cars. He also records the size of the car (small, midsize, and full-size). The table shows his summary for one week.

Car Dealer's Summary

	Small	Midsize	Full-Size
Purchased	12	9	4
Leased	3	6	11

Part A
Regardless of whether a customer purchased or leased a car, which size was most preferred? Justify your answer using the information in the table.

Part B
Of the people who purchased a car, what trend (in terms of car size) appears to be true for that week? Explain your reasoning.

Part C
What association do you see between the type of sale (purchased or leased) and the size of the car? Justify your answer using the information in the table.

---

31. The vertices of a trapezoid are $A(4, 2)$, $B(4, 0)$, $C(1, 0)$, and $D(1, 3)$.

Part A
What are the coordinates of the vertices of trapezoid $A'B'C'D'$ that is formed when $ABCD$ is reflected through the y -axis?

Part B
Trapezoid $A'B'C'D'$ is then reflected through the line $y = -x$ to form A"B"C"D". What are the coordinates of A"B"C"D"?

Part C
What transformation could be performed on A"B"C"D" to result in the original trapezoid $ABCD$?

Part D
Parts A, B, and C give a sequence of three transformations that carry the original trapezoid $ABCD$ back onto itself. Rena claims that she obtained the same result (transforming $ABCD$ back onto itself) using a different set of three transformations.

- The second transformation is reflecting through the x -axis.
- The third transformation is reflecting through the y-axis.

What was the first transformation that Rena did? Explain how you got your answer.

32. The points on the coordinate grid represent two cities. The city located at (1, 6) is in the Central Standard Time zone and the other city, located at (17, 18) is in the Eastern Standard Time zone.
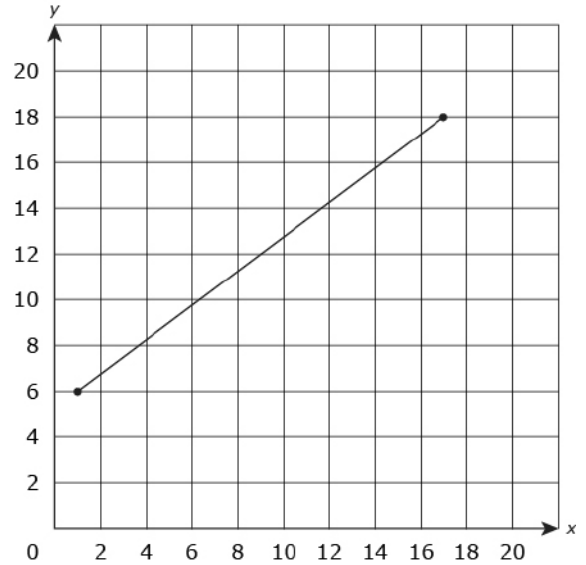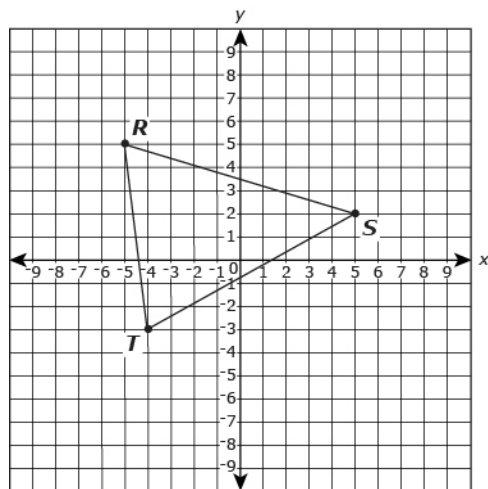

Part A
What is the distance between the two cities? Show your work.

Part B
If someone begins at (17, 18) and travels $\frac{1}{5}$ of the way toward (1, 6) they would arrive at the time zone boundary.

Which point best represents the location of the time zone boundary? Show your work.

---

33. Antonio draws triangle RST on a coordinate grid.

Part A
What are the lengths of the sides of triangle RST ? Show your work.
Part B

Antonio states that *RST* is an isosceles triangle. Is Antonio correct? Use your answers from Part A to explain your answer.

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34. All of a city's schools participated in a food-collection drive to stock the community food pantry. Each school reported the number of pounds of food collected. The histogram shows the results of the community food drive.
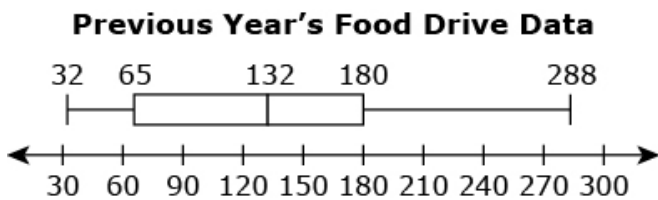
Community Food Drive
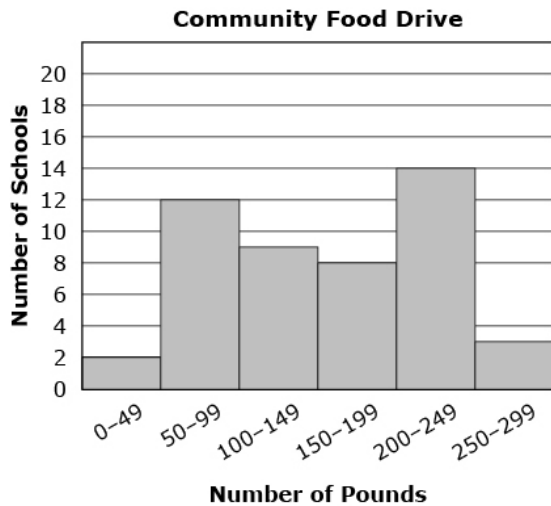
Number of Pounds

Part A
In which interval is the median number of pounds collected by the schools located? Explain your answer.

Part B
The same schools participated in the food-collection drive the previous year. The box plot gives the results for the previous year.

Previous Year's Food Drive Data

Estimate the difference, in pounds, between the medians of the two sets of data. Could the two medians be equal? Justify your answer.

35. During the first month of a new business, the expenses were $180 and the revenue was $15. During each of the next several months, the expenses and the revenue increased as shown in the table.

Time (months)	Expenses (dollars)	Revenue (dollars)
1	180	15
2	190	30
3	200	60
4	210	120

Part A
Write an equation that expresses the expenses, E, as a function of the number of months, m.

Part B
Write an equation that expresses the revenue, R, as a function of the number of months, m.

Part C
By examining only the equations you wrote in Part A and Part B, is it possible to determine whether the monthly revenue will ever exceed the monthly expenses? Explain how you know without giving any dollar amounts.

Part D
The profit of a business is determined by finding the difference between the revenue and the expenses. If both the expenses and the revenue continue to increase at a constant rate, what is the <u>total</u> profit for this business for the first 6 months? Show your work and explain your answer.

Part E
Write an equation that expresses the total profit, P, as a function of the month, m.