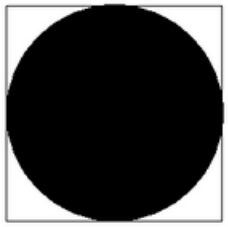
Graphs

1. In the following figure, what is the area of the shaded circle inside of the square?



4

512

256

16

50.24

12.57

ACT Test Study Guide with Practice Questions

2. In the figure below, determine the area of the shaded region of the figure.

7

9.354

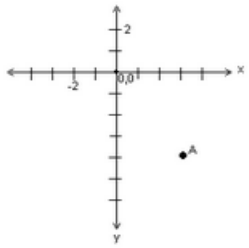
10.52

16.437

49

104.86

3. What are the coordinates of point A on the following graph?



(-3, -4)

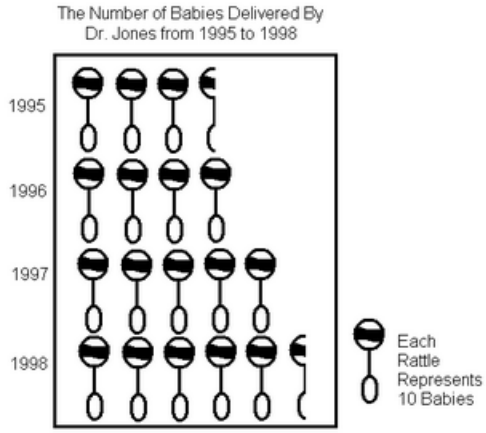
(-4, 3)

(3, -4)

(-4, -3)

(3, 4)

4. What was the average number of babies that Dr. Jones delivered each year from 1995 to 1998?



35

40

45

50

55

5. How many babies did Dr. Jones deliver in 1998?

25

35

45

55

65

6. If Dr. Jones delivered 85 babies in 1999, how many rattles would represent this number?

6 ½

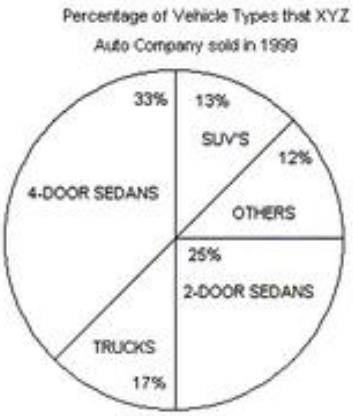
7

7 ½

8

8 ½

7. If XYZ Auto Company sold 23,000 vehicles in 1999, how many were SUV's?



2,990

3,030

3,450

4,760

4,775

8. If 7,650 trucks were sold in 1999, how many total vehicles were sold in 1999 by XYZ Auto Company?

35,000

40,000

45,000

50,000

55,000

9. If 3,750 2-door sedans were sold in 1999, then how many 4-door sedans were sold in 1999 by XYZ Auto Company?

3,578

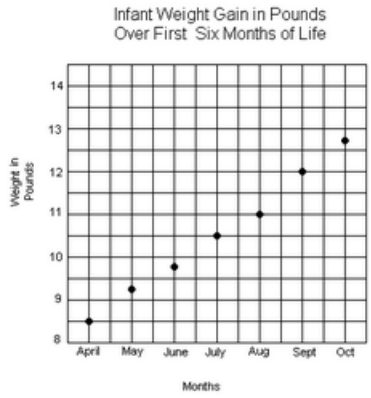
4,950

5,120

5,670

5,845

10. How much did the infant gain in the first month of life?



6 ounces

12 ounces

15 ounces

8 lbs 8 ounces

9 lbs 4 ounces

11. What was the average weight of the infant from April to October, rounded to the nearest ounce?

10 lbs

10 lbs 5 ounces

10 lbs 9 ounces

11 lbs 5 ounces

11 lbs 9 ounces

12. Between which two months did the infant gain the most weight?

April and May

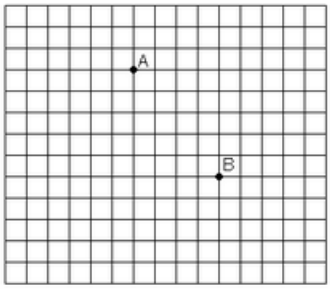
June and July

July and August

August and September

September and October

13. In the graph below, no axes or origin is shown. If point B's coordinates are (10,3), which of the following coordinates would most likely be A's?



(17, -2)

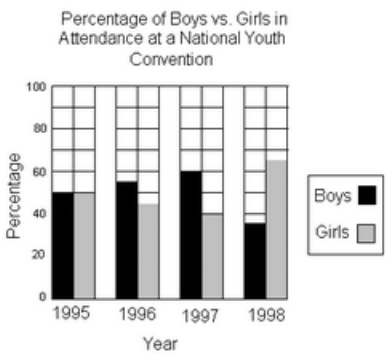
(10, 6)

(6, 8)

(-10, 3)

(-2, -17)

14. How many boys attended the 1995 convention?



Total Number in Attendance at Nation Youth Convention

Year	Number
1995	716
1996	1108
1997	1520
1998	2244

358

390

407

540

716

15. Which year did the same number of boys and girls attend the conference?

1995

1996

1997

1998

None

16. Which two years did the least number of boys attend the convention?

1995 and 1996

1995 and 1998

1996 and 1997

1996 and 1992

1997 and 1998

Answers & Explanations

1. E: The area of the circle may be found by using the formula, $A=\pi r2$. Since the square has a diameter of 4, the circle has a radius of 2. Substituting 2 for r, into the formula above, gives $A=\pi(2)2$, or $A=4\pi$. Thus, the area of the circle is approximately 12.57 square units.

2. B: The area of the square is equal to 72, or 49, square units. The area of the circle may be represented as $\pi(3.5)2$, or 12.25π, which is approximately 38.48 square units. The area of the shaded portion of the figure equals the difference of 49 square units and 38.48 square units, or 10.52 square units.

3. C: The point represents the x-value of 3 and the y-value of -4, thus the ordered pair may be written as (3, -4).

4. C: The average may be written as (35+40+50+55)/4, which equals 45.

5. D: Since each rattle represents the delivery of 10 babies, 5 1/2 rattles represents the delivery of 55 babies.

6. E: Delivery of 85 babies would be represented by 8 whole rattles and 1/2 of another rattle, since 8 1/2 . 10=85.

7. A: The number of SUVs sold is equal to 0.13 x 23,000, or 2,990.

8. C: If 7,650 trucks are sold, which constitutes 17% of the total number of vehicles sold, then the total number of vehicles sold may be determined by solving the equation, 7650 = 0.17x. Dividing both sides of the equation by 0.17 gives 45,000.

9. B: The total number of vehicles sold may be determined by solving the following equation for x: 0.25x = 3,750. Thus, 15,000 vehicles were sold. The number of 4-door sedans is equal to the product of 0.33 and 15,000, or 4,950.

10. B: The weight increased from 8.5 pounds to 9.25 pounds, showing an increase of 0.75 pounds. The number of pounds may be converted to ounces by writing and solving the following proportion: 0.75/x=1/16. Thus, the infant gained 12 ounces during the first month of life.

11. C: The average weight may be represented as the ratio, (8.5+9.25+9.75+10.5+11+12+12.75)/7, which is approximately 10.54 pounds, or 10 pounds, 9 ounces.

12. D: The infant gained 1 pound between August and September, which was the greatest increase.

13. C: A movement of 4 units to the left and 5 units up, from the point, (10, 3) gives (6, 8), since 10 - 4 = 6 and 3 + 5 = 8.

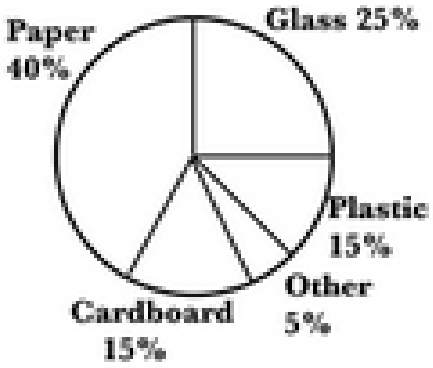
14. A: The number of boys who attended the 1995 convention may be represented as 0.50(716), which equals 358.

15. A: In 1995, 50% of the attendees were boys and 50% were girls, thus the same number of boys and girls attended the convention.

16. A: The number of boys attending the convention, from 1995 to 1998, may be represented by the expressions, 0.50(716), 0.55(1108), 0.60(1520), and 0.35(2244). Thus, the years of 1995 and 1996 had the least number of boys in attendance, with numbers of 358 and 610, respectively.

Additional Graphs

Questions 1-2 are based on the following chart:



1. The Charleston Recycling Company collects 50,000 tons of recyclable material every month. The chart shows the kinds of materials that are collected by the company's five trucks. What is the second most common material that is recycled?

Cardboard

Glass

Paper

Plastic

Other

2. Approximately how much paper is recycled every month?

40,000 tons

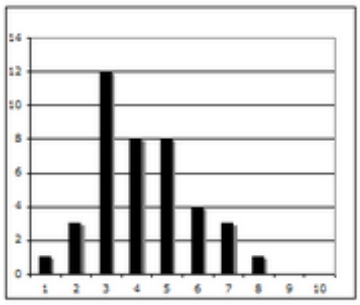
50,000 tons

60,000 tons

15,000 tons

20,000 tons

3. Forty students in a class take a test that is graded on a scale of 1 to 10. The histogram in the figure shows the grade distribution, with the x-axis representing the grades and the y-axis representing the number of students obtaining each grade. If the mean, median, and modal values are represented by n, p, and q, respectively, which of the following is true?



n > p > q

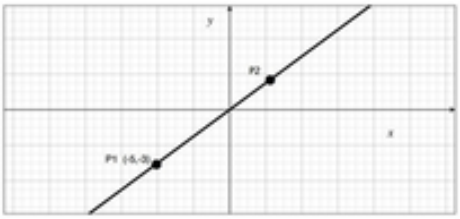
n > q > p

q > p > n

p > q > n

q > n > p

4. The graph below, not drawn to scale, shows a straight line passing through the origin. Point P1 has the (x,y) coordinates (-5,-3). What is the x-coordinate of point P2 if its y-coordinate is 3?



0.8

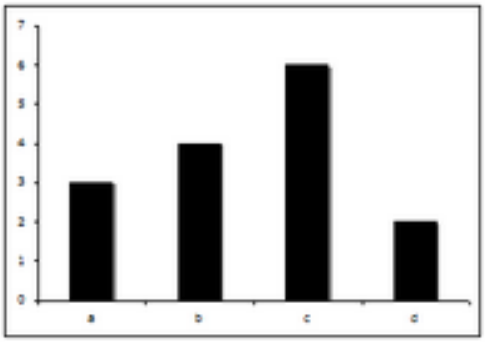
1

5

3

8

5. Examine the graph and determine which of the following is true.



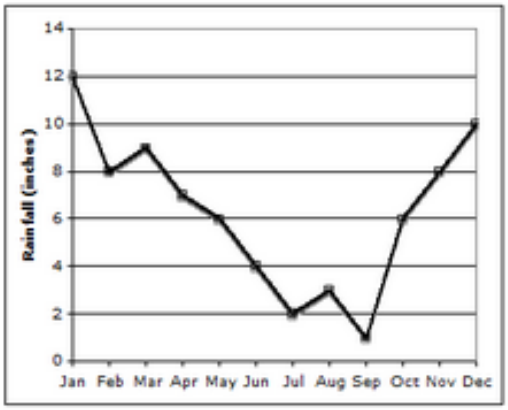
(c) minus (b) equals (b) minus (d)

(a) plus (d) equals (c)

(c) minus (d) equals (a)

(a) plus (b) equals (c) plus (d)

6. The chart below represents the average amount of rain falling each month in the town of Tegulpa. During which month of the year does the most rain fall?



January

April

August

December

7. Refer to the chart shown with Question 6. Which month shows the greatest increase in rainfall compared to the preceding month?

January

March

August

October

8. A circle graph is used to show the percent of patient types that a hospital sees. How many degrees of the circle should the graph show to represent pediatric if 1/3 of the patients are pediatric patients?

90 degrees

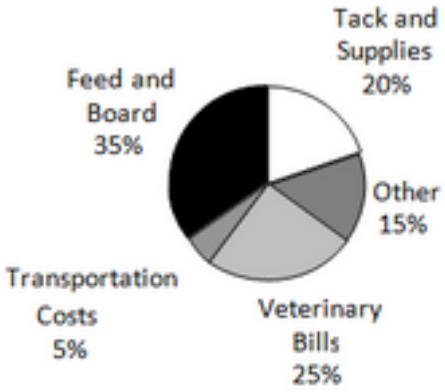
120 degrees

220 degrees

360 degrees

180 degrees

9. The graph in Figure 3 shows the monthly stable expenses for Samantha's horse. If she spends $350 for feed and board, how much does she spend on veterinary bills?



$200

$250

$275

$325

$375

10. Prizes are to be awarded to the best pupils in each class of an elementary school. The number of students in each grade is shown in the table, and the school principal wants the number of prizes awarded in each grade to be proportional to the number of students. If there are twenty prizes, how many should go to fifth grade students?

Grade	1	2	3	4	5
Students	35	38	38	33	36

Answers and Explanations

1. B: The figure is a pie chart, a circular diagram that shows the relative amounts of each variable as a slice of the whole circle. The larger the amount of the variable, the larger the slice. In addition, the percentage of each variable, or recycled material, is shown next to each slice. In this chart, paper is the most common recycled material, or the largest variable, representing 40% of the total. The next largest is glass, at 25% of the total. All the other materials represent smaller portions of the total.

2. E: The chart indicates that 40% of the total recycled material is paper. Since 50,000 tons of material are recycled every month, the total amount of paper will be 40% of 50,000 tons, or 40/100*50,000=20,000 tons.

3. A: The mean, or average, of the distribution can be computed by multiplying each grade by the number of students obtaining it, summing, and then dividing by the total number of students. Here, n = 4.2. The median is the value p for which an equal number of students have received grades that are higher or lower than p. Here, p = 4. The mode is the most frequently obtained grade, and here, q = 3. Thus, n > p > q.

4. C: Slope is defined to be (change in y) / (change in x). As the line goes from the point (-5,-3) to (0,0), y increases by 3 and x increases by 5. Thus, the slope is 3/5. Since the line is straight, the slope is the same throughout. In other words, each time y increases by 3 units, x will increase by 5 units. It is given in the problem that the y-coordinate of P2 is 3. So, as we move along the line from the origin (0,0) to P2, y has increased by 3 units. Therefore, x will increase by 5 and so the x-coordinate of P2 is 5.

5. A: Read the values of each bar from the vertical axis: (a) = 3; (b) = 4; (c) = 6; and (d) = 2. Since (c) - (b) = 6 - 4 = 2, and (b) - (d) = 4 - 2 = 2, choice A is correct.

6. A: The graph is at its highest point for the first data point, which corresponds to 12 inches of rain during the month of January.

7. D: Rainfall in October increases to 6 inches from 1 inch in September. This represents an increase of 5 inches. None of the other month-to-month differences are as great.

8. B: (360 degrees ÷ 3 = 120 degrees)

9. B: First, determine the total amount spent each month on stable expenses using the following proportion:

Dollars spent on feed = % spent on feed

Dollars spent overall % spent overall

Insert the numbers given in the problem into the formula:

350 = 35

d 100

By cross-multiplying, or d = 1000. So, Samantha spent $1000 dollars overall on stable expenses. To calculate the amount spent on veterinary

bills, multiple the percentage spent on veterinary bills (25%) by the amount spent overall (1000): 0.25 X 1000 = $250.

10. B: First, determine the proportion of students in Grade 5. Since the total number of students is 180, this proportion is ,36/180=0.2 or 20%. Then, determine the same proportion of the total prizes, which is 20% of twenty, or .