

Lesson 1-1: Using Variables

Part 1: Modeling Relationships with Variables

1. 060408a, P.I. A.A.1
Tara buys two items that cost d dollars each. She gives the cashier \$20. Which expression represents the change she should receive?
[A] $20 + 2d$ [B] $20 - 2d$
[C] $20 - d$ [D] $2d - 20$
2. 080509a, P.I. A.A.1
The sum of Scott's age and Greg's age is 33 years. If Greg's age is represented by g , Scott's age is represented by
[A] $33 - g$ [B] $g - 33$
[C] $g + 33$ [D] $33g$
3. 010604a, P.I. A.A.1
Which expression represents "5 less than the product of 7 and x "?
[A] $7x - 5$ [B] $7(x - 5)$
[C] $5 - 7x$ [D] $7 + x - 5$
4. 010820a, P.I. A.A.1
If x represents a given number, the expression "5 less than twice the given number" is written as
[A] $2x - 5$ [B] $5 - 2x$
[C] $5 < 2x$ [D] $5 < 2 + x$
5. fall0729ia, P.I. A.A.2
Which verbal expression represents $2(n - 6)$?
[A] two times the quantity n less than six
[B] two times the quantity six less than n
[C] two times n minus six
[D] two times six minus n
6. 010224a, P.I. A.A.1
Ashanti and Maria went to the store to buy snacks for their back-to-school party. They bought bags of chips, pretzels, and nachos. They bought three times as many bags of pretzels as bags of chips, and two fewer bags of nachos than bags of pretzels. If x represents the number of bags of chips they bought, express, in terms of x , how many bags of snacks they bought in all.
7. 060113b, P.I. A.A.1
A store advertises that during its Labor Day sale \$15 will be deducted from every purchase over \$100. In addition, after the deduction is taken, the store offers an early-bird discount of 20% to any person who makes a purchase before 10 a.m. If Hakeem makes a purchase of x dollars, $x > 100$, at 8 a.m., what, in terms of x , is the cost of Hakeem's purchase?
[A] $0.80x - 12$ [B] $0.20x - 15$
[C] $0.85x - 20$ [D] $0.20x - 3$
8. 010824a, P.I. A.A.1
The larger of two consecutive integers is represented by $x + 4$. Which expression represents the *smaller* integer?
[A] $x + 3$ [B] $x + 6$
[C] $x + 5$ [D] $x + 2$
9. 010006a, P.I. A.A.1
If the number represented by $n - 3$ is an odd integer, which expression represents the next greater odd integer?
[A] $n - 2$ [B] $n - 5$ [C] $n + 1$ [D] $n - 1$
10. 010506a, P.I. A.A.1
If $n + 4$ represents an odd integer, the next larger odd integer is represented by
[A] $n + 3$ [B] $n + 5$
[C] $n + 2$ [D] $n + 6$

11. 080716a, P.I. A.A.1

In the Ambrose family, the ages of the three children are three consecutive even integers. If the age of the youngest child is represented by $x + 3$, which expression represents the age of the oldest child?

- [A] $x + 8$ [B] $x + 5$
[C] $x + 7$ [D] $x + 6$

12. 010712a, P.I. A.A.1

Which expression represents the product of two consecutive odd integers, where n is an odd integer?

- [A] $n(n + 3)$ [B] $n(n + 2)$
[C] $2n + 1$ [D] $n(n + 1)$

Lesson 1-2: Exponents and Order of Operations

Part 1: Simplifying and Evaluating Expressions and Formulas

13. 060314a, P.I. 7.N.11

If the expression $3 - 4^2 + \frac{6}{2}$ is evaluated, what would be done *last*?

- [A] squaring [B] dividing
[C] adding [D] subtracting

14. 080617a, P.I. 8.N.2

If $x = 4$ and $y = -2$, the value of $\frac{1}{2}xy^2$ is

- [A] -4 [B] -8 [C] 8 [D] 32

15. 060432a, P.I. A.CM.5

Brett was given the problem: "Evaluate $2x^2 + 5$ when $x = 3$." Brett wrote that the answer was 41. Was Brett correct? Explain your answer.

16. 080408a, P.I. 8.N.2

If $x = -4$ and $y = 3$, what is the value of $x - 3y^2$?

- [A] -13 [B] -85 [C] -31 [D] -23

17. 010015a, P.I. 8.N.2

If $t = -3$, then $3t^2 + 5t + 6$ equals

- [A] -36 [B] 6 [C] 18 [D] -6

18. 060726a, P.I. 8.N.2

If $a = 3$ and $b = -1$, what is the value of $ab - b^2$?

- [A] 2 [B] 4 [C] -4 [D] -2

19. 080113a, P.I. 7.N.11

If n represents an odd number, which computation results in an answer that is an even number?

- [A] $2 \times n + 1$ [B] $3 \times n - 2$
[C] $2 \times n - 1$ [D] $3 \times n + 1$

20. 060525a, P.I. 7.N.11

If a and b are both odd integers, which expression must always equal an odd integer?

- [A] $a - b$ [B] $a \cdot b$ [C] $\frac{a}{b}$ [D] $a + b$

Part 2: Simplifying and Evaluating Expressions with Grouping Symbols

21. 080612a, P.I. 7.N.11

What is the first step in simplifying the expression $(2 - 3 \times 4 + 5)^2$?

- [A] subtract 3 from 2 [B] add 4 and 5
[C] square 5 [D] multiply 3 by 4

22. 060217a, P.I. 7.N.11

The expression $15 - 3[2 + 6(-3)]$ simplifies to

- [A] 63 [B] -45 [C] 192 [D] -33

23. 010406a, P.I. 8.N.2

What is the value of $\frac{x^2 - 4y}{2}$, if $x = 4$ and $y = -3$?

- [A] 2 [B] -2 [C] 14 [D] 10

24. 060113a, P.I. 7.N.11

If a is an odd number, b an even number, and c an odd number, which expression will always be equivalent to an odd number?

- [A] $ac(b)^2$ [B] $ac(b)^1$
[C] $a(bc)$ [D] $ac(b)^0$

29. 060303a, P.I. 7.N.2

Which expression represents an irrational number?

- [A] 0 [B] $\sqrt{2}$ [C] 0.17 [D] $\frac{1}{2}$

30. 010219a, P.I. 7.N.2

Which is an irrational number?

- [A] $\frac{3}{4}$ [B] $\sqrt{3}$ [C] $\sqrt{9}$ [D] 3.14

31. 060211a, P.I. 7.N.2

Which is an irrational number?

- [A] 0 [B] $\sqrt{9}$ [C] π [D] $-\frac{1}{3}$

Lesson 1-3: Exploring Real Numbers

Part 1: Classifying Numbers

25. 080208a, P.I. 7.N.17

The number 0.14114111411114... is

- [A] irrational [B] integral
[C] rational [D] whole

26. 010632a, P.I. 7.N.2

Write an irrational number and explain why it is irrational.

27. 069923a, P.I. 7.N.2

Which number below is irrational?

$$\sqrt{\frac{4}{9}}, \sqrt{20}, \sqrt{121}$$

Why is the number you chose an irrational number?

28. 010416a, P.I. 7.N.2

Which number is irrational?

- [A] $\frac{2}{3}$ [B] $\sqrt{8}$ [C] 0.3333 [D] $\sqrt{9}$

32. 080523a, P.I. 7.N.2

Which is an irrational number?

- [A] π [B] $0.\bar{3}$ [C] $\sqrt{49}$ [D] $\frac{3}{8}$

33. 080718a, P.I. 7.N.2

Which number is irrational?

- [A] $0.\bar{3}$ [B] $\frac{5}{4}$ [C] $\sqrt{121}$ [D] π

34. 080432a, P.I. 7.N.2

Given: $\frac{\sqrt{99}}{11}$, $\sqrt{164}$, $\sqrt{196}$

Identify the expression that is a rational number and explain why it is rational.

35. 060003a, P.I. 7.N.2

Which number is rational?

- [A] $\sqrt{\frac{3}{2}}$ [B] π [C] $\sqrt{7}$ [D] $\frac{5}{4}$

36. 060120a, P.I. 7.N.2

Which is a rational number?

- [A] $5\sqrt{9}$ [B] $6\sqrt{2}$ [C] π [D] $\sqrt{8}$

37. 080102a, P.I. 7.N.2

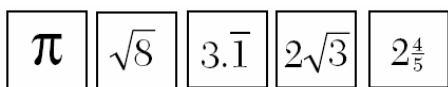
Which expression is rational?

- [A] $\sqrt{\frac{1}{4}}$ [B] $\sqrt{3}$ [C] $\sqrt{\frac{1}{2}}$ [D] π

Part 2: Comparing Numbers

38. 060433a, P.I. 7.N.3

Kyoko's mathematics teacher gave her the accompanying cards and asked her to arrange the cards in order from least to greatest. In what order should Kyoko arrange the cards?



39. 010304a, P.I. 7.N.3

In which list are the numbers in order from least to greatest?

- [A] $\sqrt{3}$, 3.2, π , $3\frac{1}{3}$ [B] 3.2, π , $3\frac{1}{3}$, $\sqrt{3}$
[C] 3.2, $3\frac{1}{3}$, $\sqrt{3}$, π [D] $\sqrt{3}$, π , 3.2, $3\frac{1}{3}$

40. 080516a, P.I. 7.N.3

Which numbers are arranged from smallest to largest?

- [A] $\sqrt{9.1}$, 3.14, π , $\frac{22}{7}$
[B] 3.14, $\frac{22}{7}$, π , $\sqrt{9.1}$
[C] $\sqrt{9.1}$, 3.14, $\frac{22}{7}$, π
[D] $\sqrt{9.1}$, π , 3.14, $\frac{22}{7}$

41. 060609a, P.I. 7.N.3

Which list is in order from smallest value to largest value?

- [A] π , $\frac{22}{7}$, 3.1, $\sqrt{10}$ [B] 3.1, π , $\frac{22}{7}$, $\sqrt{10}$
[C] 3.1, $\frac{22}{7}$, π , $\sqrt{10}$ [D] $\sqrt{10}$, $\frac{22}{7}$, π , 3.1

42. 080621a, P.I. 7.N.3

Which list shows the numbers

$|-0.12|$, $\sqrt{\frac{1}{82}}$, $\frac{1}{8}$, $\frac{1}{9}$ in order from smallest to largest?

- [A] $\sqrt{\frac{1}{82}}$, $|-0.12|$, $\frac{1}{9}$, $\frac{1}{8}$
[B] $\sqrt{\frac{1}{82}}$, $\frac{1}{9}$, $|-0.12|$, $\frac{1}{8}$
[C] $|-0.12|$, $\frac{1}{8}$, $\frac{1}{9}$, $\sqrt{\frac{1}{82}}$
[D] $\frac{1}{8}$, $\frac{1}{9}$, $\sqrt{\frac{1}{82}}$, $|-0.12|$

43. 010526a, P.I. 7.N.3

Which expression has the *smallest* value?

- [A] -3.02 [B] $-\sqrt{10}$
[C] $-\pi$ [D] $-\frac{16}{5}$

44. 010002a, P.I. 7.N.3

Which number has the greatest value?

- [A] $\frac{\pi}{2}$ [B] $\sqrt{2}$ [C] $1\frac{2}{3}$ [D] 1.5

45. 010213a, P.I. 7.N.3

Which inequality is true if $x = \frac{3.04}{1.48}$,

$y = 1.99 + 0.33$, and $z = (1.3)^3$?

[A] $x < z < y$

[B] $x < y < z$

[C] $y < x < z$

[D] $y < z < x$

46. 080717a, P.I. 7.N.3

If $t < \sqrt{t}$, t could be

[A] 4 [B] 0 [C] $\frac{1}{2}$ [D] 2

47. 069917a, P.I. 7.N.3

If $t^2 < t < \sqrt{t}$, then t could be

[A] $\frac{1}{4}$ [B] 0 [C] $-\frac{1}{4}$ [D] 4

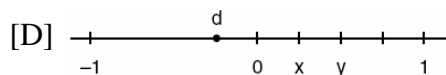
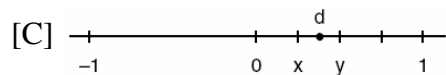
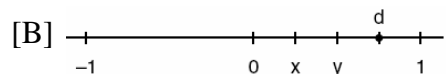
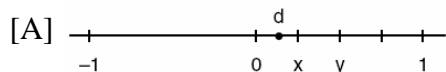
48. 010512a, P.I. 7.N.3

If $x^3 < x < \frac{1}{x}$, then x could be equal to

[A] $\frac{1}{5}$ [B] 1 [C] $\frac{6}{5}$ [D] 5

49. 010120a, P.I. 7.N.3

Let x and y be numbers such that $0 < x < y < 1$, and let $d = x - y$. Which graph could represent the location of d on the number line?



50. 080006a, P.I. 7.N.3

If $a < b$, $c < d$, and a , b , c , and d are all greater than 0, which expression is always true?

[A] $a + c > b + d$

[B] $\frac{a}{d} > \frac{b}{c}$

[C] $ac < bd$

[D] $a - c + b - d = 0$

51. 010816a, P.I. 7.N.3

In which group are the numbers arranged in order from smallest value to largest value?

[A] 3.14, $\sqrt{9.86}$, π , $\frac{22}{7}$

[B] $\sqrt{9.86}$, $\frac{22}{7}$, 3.14, π

[C] π , 3.14, $\sqrt{9.86}$, $\frac{22}{7}$

[D] $\frac{22}{7}$, 3.14, π , $\sqrt{9.86}$

52. 010518a, P.I. A.N.6

The expression $-|-7|$ is equivalent to

[A] 7 [B] -7 [C] 0 [D] 1

53. 060522a, P.I. A.N.6

If $r = 2$ and $s = -7$, what is the value of $|r| - |s|$?

[A] -9 [B] 5 [C] 9 [D] -5

Lesson 1-4: Patterns and Functions

Part 1: Writing a Function Rule

54. 080420a, P.I. 7.A.10

Which linear equation represents the data in the accompanying table?

c	d
0	20.00
1	21.50
2	23.00
3	24.50

- [A] $d = 1.50c + 20.00$
 [B] $d = 20.00c + 1.50$
 [C] $d = 1.50c$ [D] $d = 21.50c$

55. 010813a, P.I. 7.A.10

Which equation expresses the relationship between x and y , as shown in the accompanying table?

x	0	1	2	3	4
y	2	5	8	11	14

- [A] $y = 3x + 2$ [B] $y = x + 2$
 [C] $y = 2x + 3$ [D] $y = x + 3$

56. 010211a, P.I. 7.A.10

If x and y are defined as indicated by the accompanying table, which equation correctly represents the relationship between x and y ?

x	y
2	1
3	3
5	7
7	11

- [A] $y = 2x + 2$ [B] $y = x + 2$
 [C] $y = 2x - 3$ [D] $y = 2x + 3$

57. 010113a, P.I. 7.A.10

Which equation could represent the relationship between the x and y values shown in the accompanying table?

x	y
0	2
1	3
2	6
3	11
4	18

- [A] $y = x + 2$ [B] $y = 2^x$
 [C] $y = x^2$ [D] $y = x^2 + 2$

Part 2: Relationships in a Function

58. 080417a, P.I. A.A.32

If the value of dependent variable y increases as the value of independent variable x increases, the graph of this relationship could be a

- [A] vertical line [B] horizontal line
 [C] line with a negative slope
 [D] line with a positive slope

Review P. 24: Graphing on the Coordinate Plane

59. 080624a, P.I. G.G.66

The coordinates of A are $(-9, 2)$ and the coordinates of G are $(3, 14)$. What are the coordinates of the midpoint of \overline{AG} ?

- [A] $(-3, 8)$ [B] $(-6, 16)$
[C] $(-6, 6)$ [D] $(-21, -10)$

60. 080217a

M is the midpoint of \overline{AB} . If the coordinates of A are $(-1, 5)$ and the coordinates of M are $(3, 3)$, what are the coordinates of B ?

- [A] $(7, 1)$ [B] $(-5, 7)$
[C] $(1, 4)$ [D] $(2, 8)$

61. 010718a

The midpoint of \overline{AB} is $(-1, 5)$ and the coordinates of point A are $(-3, 2)$. What are the coordinates of point B ?

- [A] $(0, 7)$ [B] $(1, 8)$
[C] $(1, 10)$ [D] $(-5, 8)$

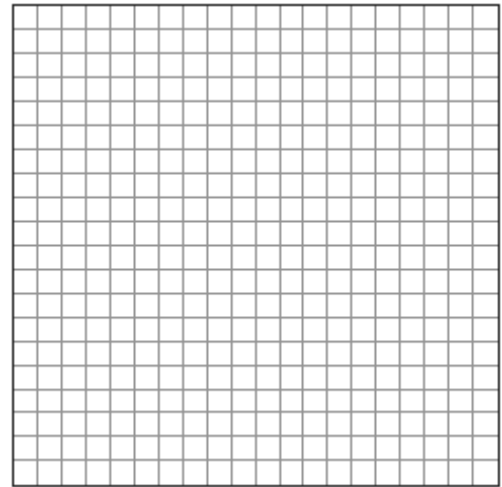
62. 080515a

A line segment on the coordinate plane has endpoints $(2, 4)$ and $(4, y)$. The midpoint of the segment is point $(3, 7)$. What is the value of y ?

- [A] 5 [B] -2 [C] 11 [D] 10

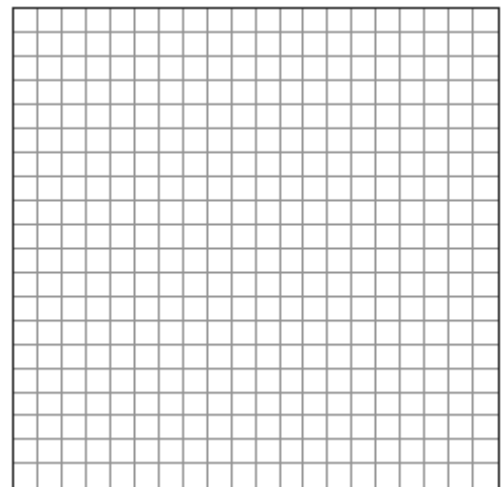
63. 060434a

The coordinates of the midpoint of \overline{AB} are $(2, 4)$, and the coordinates of point B are $(3, 7)$. What are the coordinates of point A ? [The use of the accompanying grid is optional.]



64. 010021a

The midpoint M of line segment AB has coordinates $(-3, 4)$. If point A is the origin, $(0, 0)$, what are the coordinates of point B ? [The use of the accompanying grid is optional.]



Lesson 1-5: Scatter Plots

Part 1: Analyzing Data Using Scatter Plots

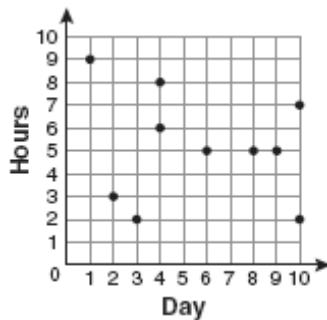
65. fall0701ia, P.I. A.S.7

For 10 days, Romero kept a record of the number of hours he spent listening to music. The information is shown in the table below.

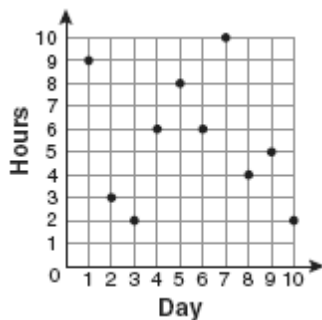
Day	1	2	3	4	5	6	7	8	9	10
Hours	9	3	2	6	8	6	10	4	5	2

Which scatter plot shows Romero's data graphically?

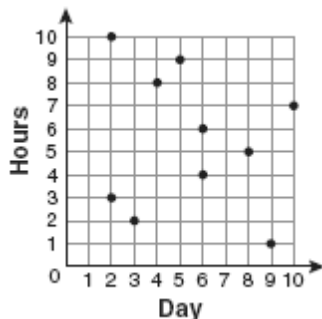
[A]



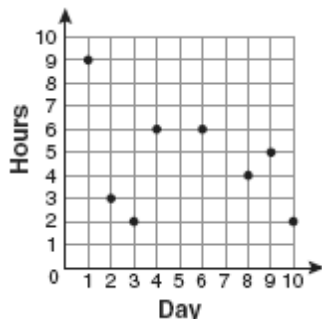
[B]



[C]



[D]



Lesson 1-6: Mean, Median, Mode, and Range

Part 1: Finding Mean, Median, and Mode

66. 080402a, P.I. 6.S.5

Rosario and Enrique are in the same mathematics class. On the first five tests, Rosario received scores of 78, 77, 64, 86, and 70. Enrique received scores of 90, 61, 79, 73, and 87. How much higher was Enrique's average than Rosario's average?

[A] 2 points [B] 3 points

[C] 15 points [D] 4 points

67. 080008a, P.I. A2.S.3

On an English examination, two students received scores of 90, five students received 85, seven students received 75, and one student received 55. The average score on this examination was

[A] 77 [B] 76 [C] 79 [D] 75

68. 080535a, P.I. 6.S.5

Seth bought a used car that had been driven 20,000 miles. After he owned the car for 2 years, the total mileage of the car was 49,400. Find the average number of miles he drove *each month* during those 2 years.

69. 010005a, P.I. 6.S.5

What was the median high temperature in Middletown during the 7-day period shown in the table below?

Daily High Temperature in Middletown	
Day	Temperature (°F)
Sunday	68
Monday	73
Tuesday	73
Wednesday	75
Thursday	69
Friday	67
Saturday	63

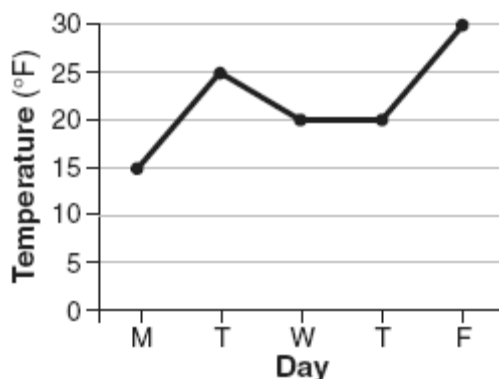
[A] 73 [B] 70 [C] 69 [D] 75

70. 060637a, P.I. 6.S.5

Sara's test scores in mathematics were 64, 80, 88, 78, 60, 92, 84, 76, 86, 78, 72, and 90. Determine the mean, the median, and the mode of Sara's test scores.

71. 080608a, P.I. 6.S.5

The accompanying graph shows the high temperatures in Elmira, New York, for a 5-day period in January.



Which statement describes the data?

[A] mean < mode [B] median = mean
[C] mean = mode [D] median = mode

72. 010118a, P.I. 6.S.5

From January 3 to January 7, Buffalo recorded the following daily high temperatures: 5°, 7°, 6°, 5°, and 7°. Which statement about the temperatures is true?

[A] mean = mode [B] median = mode
[C] mean = median [D] mean < median

73. 010315a, P.I. 6.S.5

The ages of five children in a family are 3, 3, 5, 8, and 18. Which statement is true for this group of data?

[A] median = mode [B] mode > mean
[C] mean > median [D] median > mean

74. 010618a, P.I. 6.S.5

Melissa's test scores are 75, 83, and 75. Which statement is true about this set of data?

[A] mode < median [B] mean < mode
[C] mode = median [D] mean = median

75. 060507b, P.I. A2.S.3

What is the mean of the data in the accompanying table?

Scores (x_i)	Frequency (f_i)
25	3
20	2
11	5
10	4

[A] 11 [B] 15 [C] 14.5 [D] 16

76. fall0737ia, P.I. A.S.4

The values of 11 houses on Washington St. are shown in the table below.

Value per House	Number of Houses
\$100,000	1
\$175,000	5
\$200,000	4
\$700,000	1

Find the mean value of these houses in dollars. Find the median value of these houses in dollars. State which measure of central tendency, the mean or the median, *best* represents the values of these 11 houses. Justify your answer.

77. 080501a, P.I. A.S.4

The weights of all the students in grade 9 are arranged from least to greatest. Which statistical measure separates the top half of this set of data from the bottom half?

- [A] mode [B] mean
[C] median [D] average

78. 010321b, P.I. A.S.4

Two social studies classes took the same current events examination that was scored on the basis of 100 points. Mr. Wong's class had a median score of 78 and a range of 4 points, while Ms. Rizzo's class had a median score of 78 and a range of 22 points. Explain how these classes could have the same median score while having very different ranges.

79. 069929a, P.I. A.A.6

The mean (average) weight of three dogs is 38 pounds. One of the dogs, Sparky, weighs 46 pounds. The other two dogs, Eddie and Sandy, have the same weight. Find Eddie's weight.

80. 089913a, P.I. A.A.6

If 6 and x have the same mean (average) as 2, 4, and 24, what is the value of x ?

- [A] 10 [B] 14 [C] 5 [D] 36

81. 010432a, P.I. A.A.6

TOP Electronics is a small business with five employees. The mean (average) weekly salary for the five employees is \$360. If the weekly salaries of four of the employees are \$340, \$340, \$345, and \$425, what is the salary of the fifth employee?

82. 060204a, P.I. A.A.6

During each marking period, there are five tests. If Vanita needs a 65 average to pass this marking period and her first four grades are 60, 72, 55, and 80, what is the *lowest* score she can earn on the last test to have a passing average?

- [A] 65 [B] 80 [C] 58 [D] 100

83. 080110a, P.I. A.A.6

The exact average of a set of six test scores is 92. Five of these scores are 90, 98, 96, 94, and 85. What is the other test score?

- [A] 86 [B] 92 [C] 91 [D] 89

84. 010230a, P.I. A.A.6

The students in Woodland High School's meteorology class measured the noon temperature every schoolday for a week. Their readings for the first 4 days were Monday, 56° ; Tuesday, 72° ; Wednesday, 67° ; and Thursday, 61° . If the mean (average) temperature for the 5 days was exactly 63° , what was the temperature on Friday?

85. 060017a, P.I. A.A.6
For five algebra examinations, Maria has an average of 88. What must she score on the sixth test to bring her average up to exactly 90?
[A] 100 [B] 94 [C] 92 [D] 98
86. 010026a, P.I. A.A.6
Judy needs a mean (average) score of 86 on four tests to earn a midterm grade of B. If the mean of her scores for the first three tests was 83, what is the *lowest* score on a 100-point scale that she can receive on the fourth test to have a midterm grade of B?
87. 060703a, P.I. A.A.6
In his first three years coaching baseball at High Ridge High School, Coach Batty's team won 7 games the first year, 16 games the second year, and 4 games the third year. How many games does the team need to win in the fourth year so that the coach's average will be 10 wins per year?
[A] 10 [B] 9 [C] 3 [D] 13
88. 060438a, P.I. A.A.6
On the first six tests in her social studies course, Jerelyn's scores were 92, 78, 86, 92, 95, and 91. Determine the median and the mode of her scores. If Jerelyn took a seventh test and raised the mean of her scores exactly 1 point, what was her score on the seventh test?
89. 080227a, P.I. A.A.6
Tamika could not remember her scores from five mathematics tests. She did remember that the mean (average) was exactly 80, the median was 81, and the mode was 88. If all her scores were integers with 100 the highest score possible and 0 the lowest score possible, what was the *lowest* score she could have received on any one test?

90. 060738a, P.I. A.A.6
Angelo, Brandon, and Carl work in the same office. Angelo's age is 4 years more than twice Carl's age. Brandon is 5 years younger than Carl. The average of the three ages is 41. Find the age of *each* of the men.
91. 010807b, P.I. A2.S.3
Mayken collected data about the size of the honors classes in her school building. This set of data is shown in the accompanying table.

Class Size	Frequency
8	1
10	3
14	2

Which statement about the range of this sample is true?

- [A] range > mean [B] range = mean
[C] range < standard deviation
[D] range < mean

Part 2: Stem-and-Leaf Plots

92. 060321a, P.I. 6.S.5
The student scores on Mrs. Frederick's mathematics test are shown on the stem-and-leaf plot below.

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

Key: 4 | 3 = 43 points

Find the median of these scores.

93. 080714a, P.I. 6.S.5

The accompanying stem-and-leaf plot represents Ben's test scores this year.

6	5	8				
7	2	3	3	3	3	9
8	1	3	3	6	7	
9	6	9	9			

Key: 7 | 2 = 72

What is the median score for this set of data?

[A] 79 [B] 81 [C] 73 [D] 80

94. 060509a, P.I. 6.S.5

Jorge made the accompanying stem-and-leaf plot of the weights, in pounds, of each member of the wrestling team he was coaching.

Stem	Leaf
10	9
11	
12	3 8
13	2 4 4 6 8
14	1 3 5 5 9
15	2 3 7 7 9
16	1 3 7 8 8 8 9
17	3 8

Key: 16 | 1 = 161

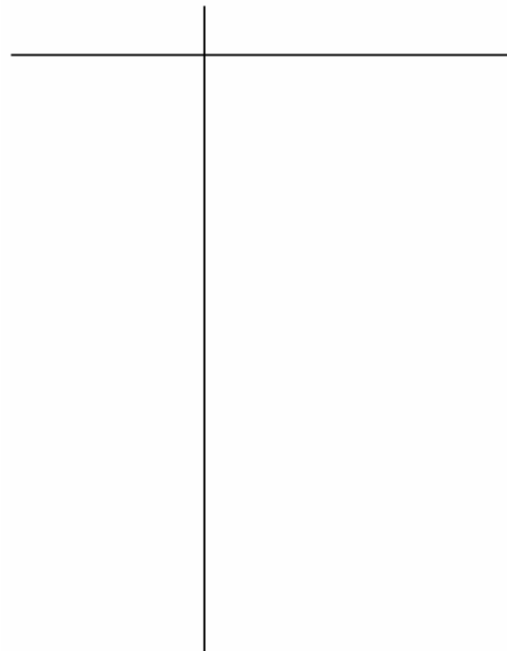
What is the mode of the weights?

[A] 145 [B] 168 [C] 150 [D] 152

95. 010535a

Construct a stem-and-leaf plot listing the scores below in order from lowest to highest.

15, 25, 28, 32, 39, 40, 43, 26, 50, 75, 65, 19,
55, 72, 50



[1] B

[2] A

[3] A

[4] A

[5] B

[2] $7x - 2$ or $x + 3x + 3x - 2$, and appropriate work is shown, such as $x + 3x + 3x - 2$ when chips = x , pretzels = $3x$, and nachos = $3x - 2$.

[1] The expressions for snacks are represented correctly, but one computational error is made in adding the expressions.

or [1] The expressions for snacks are represented incorrectly, but the expressions are added appropriately.

or [1] $7x - 2$, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[6] incorrect procedure.

[7] A

[8] A

[9] D

[10] D

[11] C

[12] B

[13] C

[14] C

[2] No, and an appropriate explanation is given or the expression is evaluated correctly.

[1] No, and the correct order of operations is used to evaluate $2(3)^2 + 5$, but one computational error is made.

or [1] One conceptual error is made in evaluating the expression, but the question is answered appropriately.

or [1] Appropriate work is shown, but the question is not answered.

[0] No, but no explanation or an inappropriate explanation is given.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[15] obviously incorrect procedure.

[16] C

[17] C

[18] C

[19] D

[20] B

[21] D

[22] A

[23] C

[24] D

[25] A

- [2] An irrational number is written, and an appropriate explanation is written, such as an irrational number cannot be written as a fraction or as a repeating or terminating decimal.
[1] An irrational number is written, such as π or the square root of a nonperfect square, but no explanation or an inappropriate explanation is written.
or [1] A correct definition of an irrational number is written, but the example is missing or is inappropriate.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [26] _____

- [2] $\sqrt{20}$ and an appropriate explanation is given, such as the number cannot be written as a repeating or terminating decimal or it cannot be written as a fraction or it is not a perfect square.
[1] $\sqrt{20}$ and an inappropriate explanation or no explanation is given.
or [1] $\sqrt{20}$ and a correct explanation is given, but one other number is also identified as irrational.
[0] All three numbers are identified as irrational.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [27] _____

- [28] B
- [29] B
- [30] B
- [31] C
- [32] A
- [33] D

- [2] $\sqrt{196}$, and an appropriate explanation is given.
[1] An incorrect answer is chosen, but an appropriate explanation is given.
or [1] $\sqrt{196}$, but no explanation or an incorrect explanation is given.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [34] _____

- [35] D
- [36] A
- [37] A

- [2] $2\frac{4}{5}$, $\sqrt{8}$, $3.\bar{1}$, π , $2\sqrt{3}$ and appropriate work is shown, such as converting each value to a decimal equivalent.
[1] All values are correctly converted to decimal equivalents, but the order is not indicated or is indicated incorrectly.
or [1] One or two computational errors are made in finding decimal equivalents, but the appropriate order is indicated.
or [1] Appropriate work is shown, but one conceptual error is made, such as indicating the order from greatest to least.
or [1] $2\frac{4}{5}$, $\sqrt{8}$, $3.\bar{1}$, π , $2\sqrt{3}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [38] _____

- [39] D
- [40] A
- [41] B
- [42] B
- [43] D
- [44] C

- [45] A
- [46] C
- [47] A
- [48] A
- [49] D
- [50] C
- [51] A
- [52] B
- [53] D
- [54] A
- [55] A
- [56] C
- [57] D
- [58] D
- [59] A
- [60] A
- [61] B
- [62] D

[2] (1,1), and appropriate work is shown, such as a correct graph of \overline{AB} and an appropriate explanation of how point A is found or the use of the midpoint formula.

[1] Appropriate work is shown, but one computational or graphing error is made.
or [1] Appropriate work is shown, but one conceptual error is made, such as finding the midpoint of the given coordinates.
or [1] The midpoint and points A and B are graphed correctly, but the coordinates of point A are not stated or are stated incorrectly.
or [1] (1,1), but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[63]

[2] (-6,8) or -6,8 or $x = -6$ and $y = 8$ and an appropriate explanation is given, such as graphing the line or doubling the coordinates.
[1] One correct coordinate and one incorrect coordinate are found.

or [1] An appropriate method is shown, such as algebraic or graphing, but computational mistakes are made.

or [1] (-6,8) or -6,8 or $x = -6$ and $y = 8$ and no explanation is given.

or [1] Substitutions are correct for the midpoint formula, but computational mistakes are made.

or [1] The student properly locates point B on the graph but does not state its coordinates.

or [1] Point A and point M are reversed, resulting in B(3,-4), and an explanation is given.

[0] Only the midpoint of \overline{AM} $(-\frac{3}{2}, 2)$ is found.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[64]

[65] B

[66] B

[67] C

[2] 1,225, and appropriate work is shown, such as solving an equation or writing an explanation.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] Appropriate work is shown, but the conversion from years to months is incorrect, but an appropriate solution is found.

or [1] 1,225, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[68] incorrect procedure.

[69] C

[3] Mean = 79, median = 79, and mode = 78, and appropriate work is shown.

[2] Appropriate work is shown, but only two of the three measures of central tendency are determined and identified correctly.

or [2] Appropriate work is shown and all three measures of central tendency are determined correctly, but the measures are not identified or are identified incorrectly.

[1] Appropriate work is shown, but only one of the three measures of central tendency is determined and identified correctly.

or [1] Mean = 79, median = 79, and mode = 78, but no work is shown.

[0] 79, 79, and 78, but no work is shown, and the answers are not identified or are identified incorrectly.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[70] obviously incorrect procedure.

[71] D

[72] C

[73] C

[74] C

[75] B

[4] Mean = 225,000, median = 175,000, and the median is stated to be the best measure of central tendency, an appropriate justification is given, and appropriate work is shown.

[3] Appropriate work is shown, but one computational error is made, but an appropriate measure of central tendency is stated, and an appropriate justification is given.

or [3] Mean = 225,000, median = 175,000, and the median is stated to be the best measure of central tendency, but no justification is given.

[2] Appropriate work is shown, but two or more computational errors are made, but an appropriate measure of central tendency is stated, and an appropriate justification is given.

or [2] Appropriate work is shown, but one conceptual error is made.

or [2] Appropriate work is shown to find mean = 225,000 and median = 175,000, but no further correct work is shown.

[1] Appropriate work is shown, but one computational error and one conceptual error are made.

or [1] Mean = 225,000 and median = 175,000, but no further work is shown.

[0] Mean = 225,000 or median = 175,000, but no further work is shown.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[76] obviously incorrect procedure.

[77] C

[2] An appropriate explanation is given, such as:

One very high or very low score in either class would have a great effect on the range for that class, but might not affect the median at all. The range is the difference between the two most extreme values, the lowest and the highest. The median, being the middle value, is not very sensitive to outliers or to extreme values.

or [2] Specific examples are shown to illustrate the situation.

[1] An understanding of median and range is demonstrated, but the specific situation is not explained.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[78] incorrect procedure.

[3] 34 and an appropriate explanation is given, such as $38 = \frac{46 + 2x}{3}$.

[2] An appropriate method or equation is shown, but one computational mistake is made.

or [2] The student does not take into consideration two dogs of equal weight and gives an answer of 68.

[1] The student understands weighted average in that three dogs averaging 38 pounds must have a total weight of 114 pounds but does not subtract the known weight.

or [1] 34 and no explanation is given.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[79] incorrect procedure.

[80] B

[2] \$350, and appropriate work is shown,

such as $\frac{1450 + x}{5} = 360$ or trial and error with

at least three trials and appropriate checks.

[1] Appropriate work is shown, but one computational error is made.

or [1] The total of the five salaries is shown to be $5 \times 360 = 1800$, but no further correct work is shown.

or [1] \$350, but no work is shown or fewer than three trials with appropriate checks are shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[81] incorrect procedure.

[82] C

[83] D

[3] 59 or 59°, and appropriate work is shown,

such as $63 = \frac{256 + x}{5}$ or

$56 + 72 + 67 + 61 = 256$, $63 \times 5 = 315$, and $315 - 256 = 59$.

[2] Appropriate work is shown, but one computational error is made.

or [2] A value is chosen for Friday's temperature that rounds to 63, such as 57 or 61,

but whose mean is not exactly 63, and appropriate work is shown.

[1] A limited understanding of the concept of the mean is shown, such as the sum of the temperatures must be 315, but the given temperatures are not subtracted.

or [1] The correct mean of the four given temperatures is calculated.

or [1] 59 or 59°, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[84] incorrect procedure.

[85] A

[3] 95 and an appropriate method is shown that obtains an answer, such as $344 - 249$ or a similar equation or method.

or [3] Four scores are tried that round off to an average of 86, such as 93 or 94. Round off to 86 must be shown.

[2] An appropriate method is shown, but one computational mistake is made.

[1] The student understands weighted average and shows that the average of 83 for 3 tests is a total of 249 points.

or [1] 95 and no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[86] incorrect procedure.

[87] D

[4] Median = 91.5, mode = 92, and seventh test score = 96, and appropriate work is shown.

[3] Appropriate work is shown, but one computational error is made.

or [3] Seventh test score = 96, but only the median or the mode is found correctly, but appropriate work is shown.

or [3] 91.5, 92, and 96, and appropriate work is shown, but the median and mode are not labeled or are labeled incorrectly.

[2] Appropriate work is shown, but two or more computational errors are made.

or [2] Appropriate work is shown, but one conceptual error is made.

or [2] Both the median and the mode are found and labeled correctly, and appropriate work is shown, but the seventh test score is not found or is found incorrectly.

or [2] Seventh test score = 96, and appropriate work is shown, but the median and the mode are not found or are found incorrectly.

[1] Either the median or the mode is found and labeled correctly, and appropriate work is shown, but no further correct work is shown.

or [1] Median = 91.5, mode = 92, and seventh test score = 96, but no work is shown.

[0] Median = 91.5 or mode = 92 or seventh test score = 96, but no work is shown.

or [0] 91.5, 92, and 96, but no work is shown and the answers are not labeled.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[88] obviously incorrect procedure.

[3] 63, and appropriate work is shown, such as $400 - (81 + 88 + 88)$ and determining the highest and lowest possible scores remaining that total 143.

[2] Appropriate work is shown, but one computational error is made.

[1] A total of 400 is shown, but one conceptual error is made, such as 257 is subtracted, and then 143 is split into 72 and 71, resulting in an answer of 71.

or [1] Appropriate work is shown, but more than one computational error is made.

or [1] No answer or an incorrect answer is found, but a list such as ____, ____, 81, 88, 88 is shown.

or [1] 63, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[89] incorrect procedure.

[4] Angelo is 66, Brandon is 26, and Carl is 31, and appropriate work is shown, such as solving an equation or trial and error with at least three trials and appropriate checks.

[3] Appropriate work is shown, but one computational error is made.

or [3] 66, 26, and 31, and appropriate work is shown, but the solutions are not labeled or are labeled incorrectly.

[2] Appropriate work is shown, but two or more computational errors are made.

or [2] Appropriate work is shown, but one conceptual error is made.

or [2] The trial-and-error method is used to find a correct solution, but only two trials and appropriate checks are shown.

or [2] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.

or [2] Carl is 31, and appropriate work is shown, but the ages of the other men are not found.

or [2] An incorrect equation of equal difficulty is solved appropriately.

[1] Appropriate work is shown, but one conceptual error and one computational error are made.

or [1] A correct equation is written, but no further correct work is shown.

or [1] Angelo is 66, Brandon is 26, and Carl is 31, but no work or only one trial with an appropriate check is shown.

[0] Angelo is 66 *or* Brandon is 26 *or* Carl is 31, but no work is shown.

or [0] 66, 26, and 31, but no work is shown, and the answers are not labeled or are labeled incorrectly.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[90] obviously incorrect procedure.

[91] D

[2] 77, and appropriate work is shown, such as $(76 + 78) \div 2$.

[1] 76 and 78 are identified.

or [1] 77, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[92] incorrect procedure.

[93] D

[94] B

[2] A correct stem-and-leaf plot is drawn, including a key.

[1] The data are arranged correctly, but incorrect labels are written on the stem-and-leaf columns. [Columns do not need to be labeled for a full-credit response, but full credit may not be awarded if the columns are labeled incorrectly.]

or [1] The data are listed in the stem-and-leaf plot, but not in ascending order.

or [1] One or two of the scores are left out of the stem-and-leaf plot.

or [1] Duplicate values are left out of the stem-and-leaf plot.

[0] Incorrect labels are written on the stem-and-leaf columns, and scores are left out of the plot.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[95] obviously incorrect procedure.
