

Algebra 1 Spring Semester Final Exam Review

What is the simplified form of each expression?

- $(-5.1)^0$
a. 1 b. 0 c. -5.1 d. -1
- $(-2)^{-5}$
a. 10 b. $-\frac{1}{32}$ c. -32 d. $\frac{1}{32}$
- What is the value of $2x^{-2}y^{-2}$ for $x = 3$ and $y = -2$?
a. $\frac{1}{18}$ b. 72 c. $2(-6)^{-4}$ d. $\frac{1}{648}$

What is each expression written using each base only once?

- $4^8 \cdot 4^3$
a. 4^{11} b. 12^{11} c. 4^{24} d. 64^{11}

What is the simplified form of each expression?

- $(-2x^8) \cdot 3y^9 \cdot 2x^4$
a. $3x^{12}y^9$ b. $-12x^{72}y^9$ c. $-12xy^{21}$ d. $-12x^{12}y^9$

What is the simplified form of the expression?

- $t^8(t^{10})^0$
a. t^{80} b. t^{80} c. t^8 d. t^{-8}
- $(y^{-5})^{-10}y^{10}$
a. y^{-60} b. y^{60} c. y^{-60} d. y^{-150}

What is the simplified form of each expression?

- $(3c^2d^4)^3(2c^5d^8)^3$
a. $216c^{21}d^{36}$ b. $-216c^{21}d^{36}$ c. $216c^{13}d^{18}$ d. $\frac{8c^{21}d^{36}}{27}$

What is the simplified form of each expression?

- $\frac{c^8d^{-12}}{c^{-4}d^{-8}}$
a. $c^{12}d^4$ b. $c^{-4}d^{-4}$ c. $\frac{d^{-4}}{d^{-12}}$ d. $\frac{c^{12}}{d^4}$

What is the simplified form of the expression?

10. $\left(\frac{m^2}{10j^5}\right)^2$

- a. $10m^4j^{10}$ b. $\frac{m^4}{100j^{10}}$ c. $\frac{m^4}{20j^{10}}$ d. $\frac{m^4}{10j}$

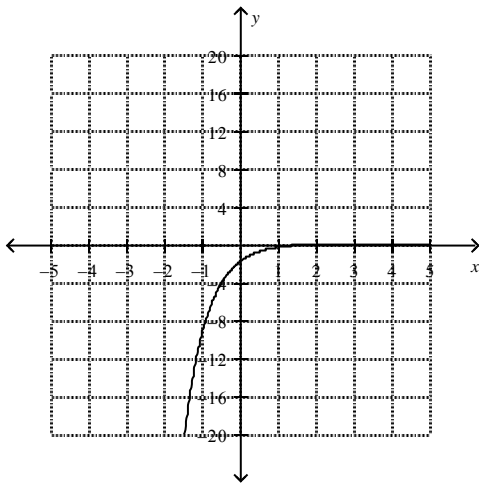
11. Does the table represent an exponential function?

x	1	2	3	4
y	-1	-8	-27	-64

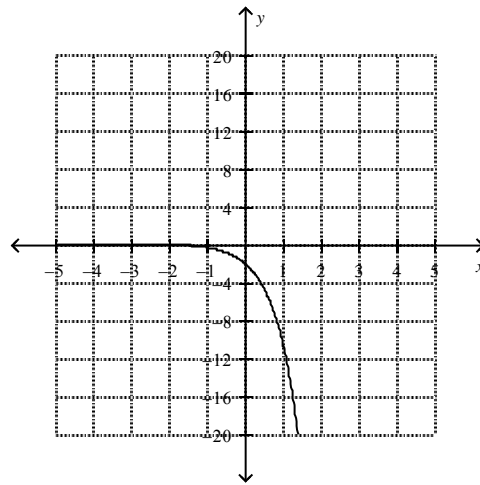
- a. yes b. no
12. Does the rule $y = -3x^5$ represent an exponential function?
a. yes b. no
13. Suppose a population of 160 crickets doubles in size every month. The function $f(x) = 160 \cdot 2^x$ gives the population after x months. How many crickets will there be after 2 years?
a. 2,684,354,560 crickets c. 7,680 crickets
b. 640 crickets d. 640 crickets

What is the graph of the function? (Choices B and D are on next page)

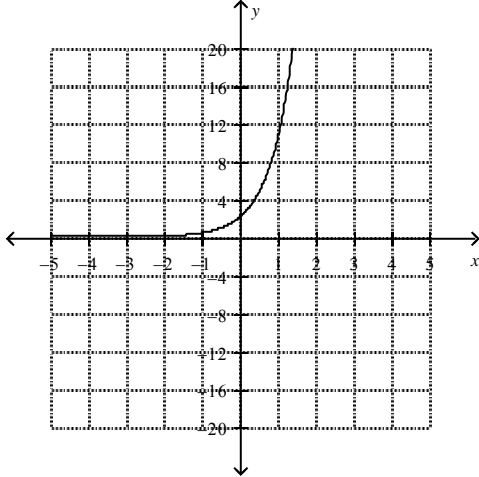
14. $y = -2 \cdot 5^x$
a.



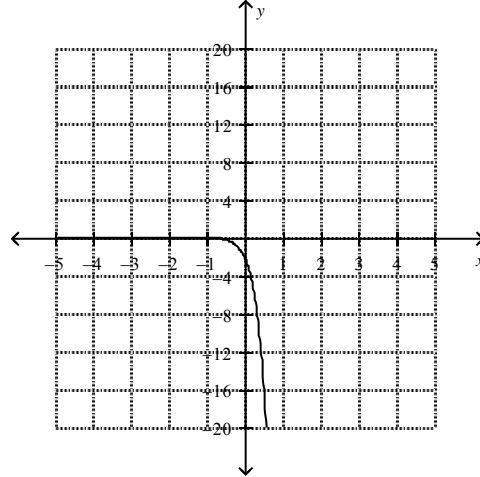
c.



b.



d.



15. Suppose the population of a town is 4,400 and is growing 2% each year. Predict the population after 7 years.

- a. about 31416 people
- b. about 61,600 people
- c. about 5,054 people
- d. about 563,200 people

Find the balance in the account.

- 16. \$1,000 principal earning 6.25%, compounded quarterly, after 7 years
 - a. \$29,750.00
 - b. \$1,114.64
 - c. \$1,543.60
 - d. \$1,528.63
- 17. A boat costs \$11,850 and decreases in value by 10% per year. How much will the boat be worth after 8 years?
 - a. \$5,101.04
 - b. \$11,770.00
 - c. \$4,590.93
 - d. \$25,401.53

What is the sum or difference?

- 18. $6x^7 + 8x^7$
 - a. $14x^7$
 - b. $-2x^7$
 - c. $14x^{14}$
 - d. $48x^7$
- 19. $3x^8 - 7x^8$
 - a. $-4x^{16}$
 - b. $-21x^8$
 - c. $-4x^8$
 - d. $10x^8$

Simplify the sum.

- 20. $(8u^3 + 2u^2 + 7) + (3u^3 - 7u + 8)$
 - a. $5u^3 - 7u^2 + 2u - 15$
 - b. $11u^3 + 2u^2 - 7u + 15$
 - c. $15 - 7u + 2u^2 + 11u^3$
 - d. $5u^3 + 2u^2 - 7u + 15$

Simplify the difference.

- 21. $(2w^2 - 4w - 8) - (5w^2 + 3w - 2)$
 - a. $7w^2 - w - 10$
 - b. $7w^2 + 7w + 6$
 - c. $-3w^2 - 7w - 6$
 - d. $-3w^2 - w - 10$

Simplify the product.

- 22. $2n(n^2 + 3n + 4)$
 - a. $2n^3 + 6n^2 + 8n$
 - b. $2n^3 + 3n + 4$
 - c. $2n^3 + 6n + 8$
 - d. $n^2 + 5n + 4$

Find the GCF of the terms of the polynomial.

23. $30x^3 + 16x^5$
a. $16x$ b. $2x^3$ c. $2x^5$ d. x^3

Factor the polynomial.

24. $42w^{10} + 24w^6$
a. $w^6(42w^4 + 24)$ c. $6(7w^{10} + 4w^6)$
b. $6w^6(7w^4 + 4)$ d. $6w^5(7w^5 + 4w)$

Simplify the product using any method you choose.

25. $(5k - 3)(3k + 7)$
a. $15k^2 - 44k + 21$ c. $15k^2 + 44k + 21$
b. $15k^2 - 26k - 21$ d. $15k^2 + 26k - 21$
26. $(-2k + 5)(5k - 2)$
a. $-10k^2 - 21k + 10$ c. $-10k^2 - 29k - 10$
b. $-10k^2 + 21k + 10$ d. $-10k^2 + 29k - 10$
27. $(4x - 4)(3x - 4)$
a. $12x^2 - 28x + 16$ c. $12x^2 + 4x - 16$
b. $12x^2 - 4x - 16$ d. $12x^2 + 28x + 16$

What is a simpler form of the expression?

28. $(2n^2 + 5n + 4)(2n - 4)$
a. $4n^3 - 2n^2 + 28n - 16$ c. $4n^3 + 2n^2 - 12n - 16$
b. $4n^3 + 12n^2 - 2n - 16$ d. $4n^3 + 18n^2 - 28n - 16$
29. $(8m + 1)^2$
a. $64m^2 - 16m + 1$ c. $64m^2 + 16m + 1$
b. $64m^2 + 8m - 1$ d. $64m^2 + 16m - 1$
30. $(7p - 8)(7p + 8)$
a. $49p^2 + 112p + 64$ c. $49p^2 + 64$
b. $49p^2 - 112p - 64$ d. $49p^2 - 64$

What is the factored form of the following expressions?

31. $d^2 + 12d + 32$
a. $(d + 8)(d + 4)$ c. $(d - 8)(d + 4)$
b. $(d - 8)(d - 4)$ d. $(d + 8)(d - 4)$
32. $d^2 - 18d + 80$
a. $(d - 8)(d + 10)$ c. $(d - 8)(d - 10)$
b. $(d + 8)(d + 10)$ d. $(d + 8)(d - 10)$

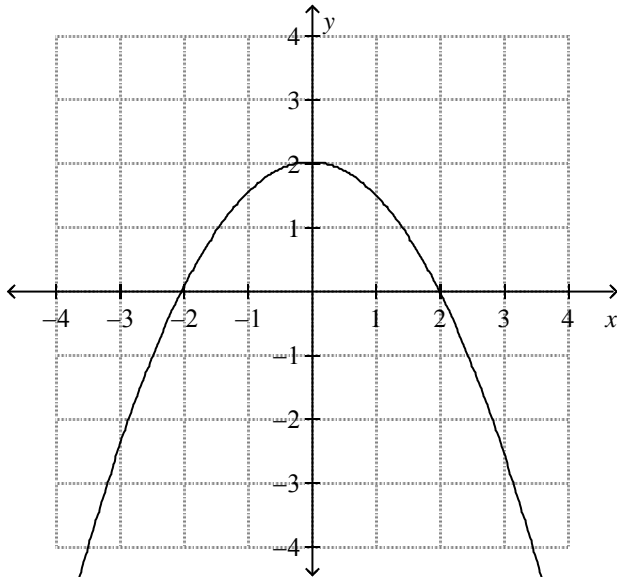
33. $10x^2 + 41x + 40$
 a. $(2x + 5)(5x - 8)$ c. $(2x - 5)(5x + 8)$
 b. $(2x + 5)(5x + 8)$ d. $(2x - 5)(5x - 8)$
34. $8g^2 + 6g - 9$
 a. $(4g + 3)(2g + 3)$ c. $(4g + 3)(2g - 3)$
 b. $(4g - 3)(2g - 3)$ d. $(4g - 3)(2g + 3)$
35. $12x^2 + x - 6$
 a. $(3x + 2)(4x + 3)$ c. $(3x - 2)(4x + 3)$
 b. $(3x - 2)(4x - 3)$ d. $(3x + 2)(4x - 3)$
36. The area of a rectangular pool is given by the trinomial $8y^2 + 4y - 12$. What are the possible dimensions of the pool? Use factoring.
 a. $-2y - 2$ and $-4y - 6$ c. $2y - 2$ and $4y + 6$
 b. $2y - 2$ and $4y + 6$ d. $2y + 2$ and $4y - 6$

What is the factored form of the expression?

37. $60y^2 - 51y - 72$
 a. $(5y + 8)(4y - 3)$ c. $3(5y + 8)(4y + 3)$
 b. $3(5y - 8)(4y + 3)$ d. $(5y - 8)(12y + 9)$
38. $s^2 - 16$
 a. $(s - 4)(s - 4)$ c. $(s - 4)(s + 4)$
 b. $(s + 4)(s + 4)$ d. $(s - 4)(s + 6)$
39. $15g^3 + 20g^2 - 18g - 24$
 a. $(5g^2 + 4)(3g - 6)$ c. $(5g^2 + 6)(3g - 4)$
 b. $(5g^2 - 6)(3g + 4)$ d. $(5g^2 - 4)(3g + 6)$

What are the coordinates of the vertex of the graph? Is it a maximum or minimum?

40.



- | | |
|--------------------|--------------------|
| a. (2, 0); minimum | c. (2, 0); maximum |
| b. (0, 2); minimum | d. (0, 2); maximum |

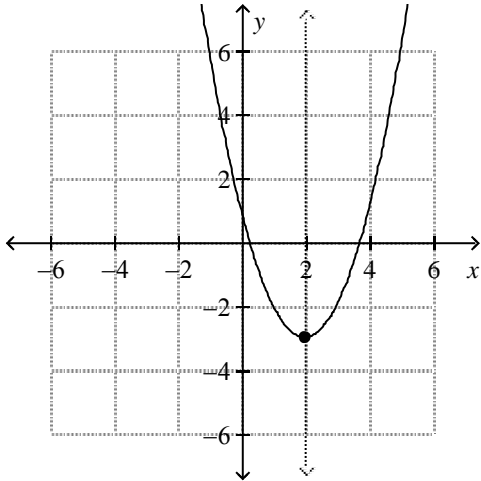
Order the group of quadratic functions from widest to narrowest graph.

41. $y = -5x^2$, $y = -x^2$, $y = -4x^2$
- | | |
|---|---|
| a. $y = -x^2$, $y = -5x^2$, $y = -4x^2$ | c. $y = -5x^2$, $y = -4x^2$, $y = -x^2$ |
| b. $y = -x^2$, $y = -4x^2$, $y = -5x^2$ | d. $y = -4x^2$, $y = -x^2$, $y = -5x^2$ |
42. How is the graph of $y = -2x^2 - 5$ different from the graph of $y = -2x^2$?
- | | |
|----------------------------------|-----------------------------------|
| a. It is shifted 5 unit(s) up. | c. It is shifted 5 unit(s) left. |
| b. It is shifted 5 unit(s) down. | d. It is shifted 5 unit(s) right. |
43. If an object is dropped from a height of 144 feet, the function $h(t) = -16t^2 + 144$ gives the height of the object after t seconds. When will the object hit the ground?
- | | |
|----------|--------|
| a. 1.5 s | c. 6 s |
| b. 3 s | d. 9 s |

Graph the function. Identify the vertex and axis of symmetry.

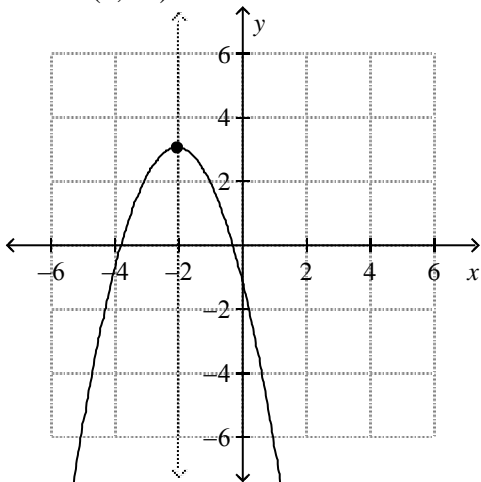
44. $f(x) = x^2 + 4x + 1$

a.



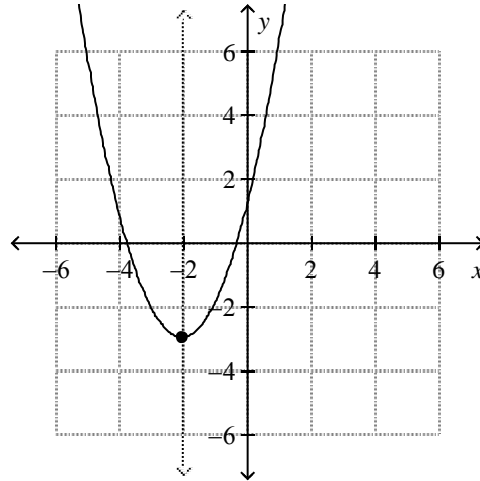
axis of symmetry: $x = 2$
vertex: $(2, -3)$

b.



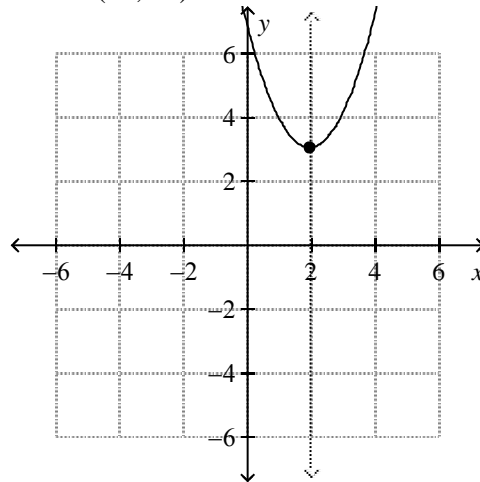
axis of symmetry: $x = -2$
vertex: $(-2, 3)$

c.



axis of symmetry: $x = -2$
vertex: $(-2, -3)$

d.



axis of symmetry: $x = 2$
vertex: $(2, 3)$

Solve the equation using square roots.

45. $x^2 - 81 = 0$

- a. $-\sqrt{9}, \sqrt{9}$
- b. $-81, 81$

- c. $-9, 9$
- d. no real number solutions

Solve the equation using the Zero-Product Property.

46. $(x - 9)(x + 7) = 0$

- a. $9, 7$
- b. $-9, -7$
- c. $-1, 1$
- d. $9, -7$

47. $-9m(5m - 5) = 0$

- a. $-\frac{1}{9}, 1$
 b. $0, 1$

- c. $-\frac{1}{9}, -1$
 d. $0, -1$

What are the solutions of the equation?

48. $z^2 - 6z - 27 = 0$

- a. $3, 9$
 b. $3, -9$

- c. $-3, 9$
 d. $-3, -9$

49. $3z^2 + 3z - 6 = 0$

- a. $1, -2$
 b. $1, 2$

- c. $3, -2$
 d. $3, 2$

50. $x^2 + 3x = 18$

- a. $3, -6$ b. $-3, 6$

- c. $4.42, -4.42$ d. $18.75, -21.75$

Use the quadratic formula to solve the equation. If necessary, round to the nearest hundredth.

51. $x^2 + 3 = -4x$

- a. $1, 3$ b. $-1, -3$

- c. $1, -3$ d. $1, -3$

52. $x^2 + 3 = 9x$

- a. $0.35, -8.65$ b. $-0.35, -8.65$

- c. $0.35, 8.65$ d. $-0.35, 8.65$

How many real-number solutions does the equation have?

53. $-7x^2 + 6x + 3 = 0$

- a. one solution
 b. two solutions

- c. no solutions
 d. infinitely many solutions

54. $-8x^2 - 8x - 2 = 0$

- a. one solution
 b. two solutions

- c. no solutions
 d. infinitely many solutions

55. $7x^2 + 8x + 5 = 0$

- a. one solution
 b. two solutions

- c. no solutions
 d. infinitely many solutions

Simplify the radical expression.

56. $\sqrt{72}$

- a. 2 b. $6\sqrt{2}$

- c. $6\sqrt{2}$ d. 12

57. $\sqrt{250h^4k^5}$

- a. $hk\sqrt{125}$
 b. $5\sqrt{10h^4k^5}$

- c. $5h^2k^2\sqrt{10k}$
 d. $5\sqrt{10h^4k^5}$

58. The number of eagles observed along a certain river per day over a two week period is listed below. What is a frequency table that represents the data?

1 3 2 5 10 8 9 15 0 7 12 13 6 18

a.

Eagles	Frequency
0-4	2
5-9	3
10-14	4
15-19	5

c.

Eagles	Frequency
0-4	4
5-9	5
10-14	3
15-19	2

b.

Eagles	Frequency
0-4	4
5-9	5
10-14	2
15-19	3

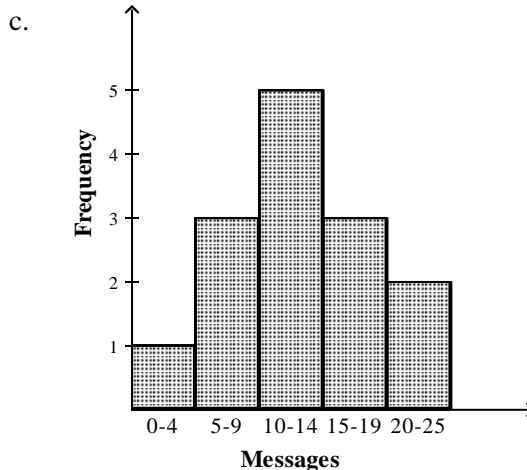
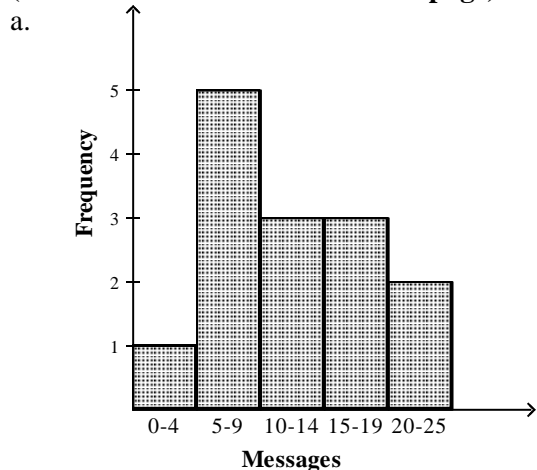
d.

Eagles	Frequency
0-4	5
5-9	4
10-14	2
15-19	3

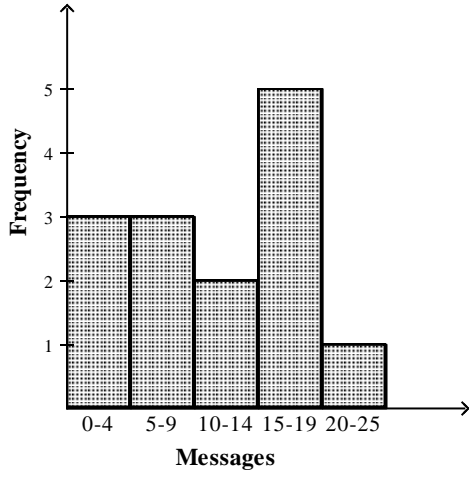
59. The data below shows the average number of text messages a group of students send per day. What is a histogram that represents the data?

20 5 8 22 10 1 7 15 16 12 15 6 13 8

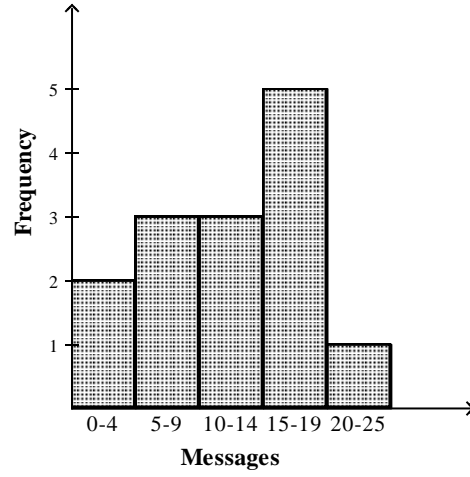
(Choices B and D are on the next page)



b.

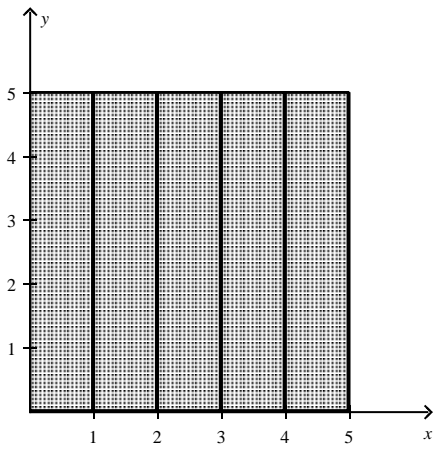


d.



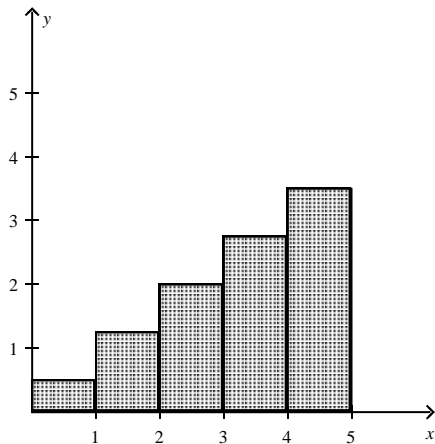
Is the histogram *uniform*, *symmetric*, or *skewed*?

60.



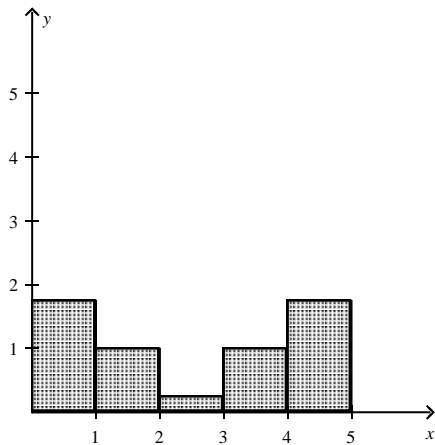
- a. uniform
- b. symmetric
- c. skewed

61.



- a. Uniform
- b. symmetric
- c. skewed

62.



- a. uniform
- b. symmetric
- c. skewed

Find the mean, median, and mode of the data set. Round to the nearest tenth.

63. test scores on a math exam:

88, 89, 65, 62, 83, 63, 84, 63, 74, 64, 71, 82, 66, 88, 79, 60, 86, 63, 93, 99, 60, 85

- | | | | |
|-----------------|-----------------|-----------------|-----------------|
| a. mean = 75.8, | b. mean = 75.8, | c. mean = 69.5, | d. mean = 69.5, |
| median = 79.5, | median = 76.5, | median = 76.5, | median = 76.5, |
| mode = 63 | mode = 63 | mode = 63 | mode = 79.5 |

64. Suppose that to make the golf team you need to score no more than 81 on average over 5 games. If you scored 75, 74, 100, and 69 in your first 4 games what is the highest score you can shoot in your 5th game and still make the team?

- a. 88
- b. 85
- c. 87
- d. 89

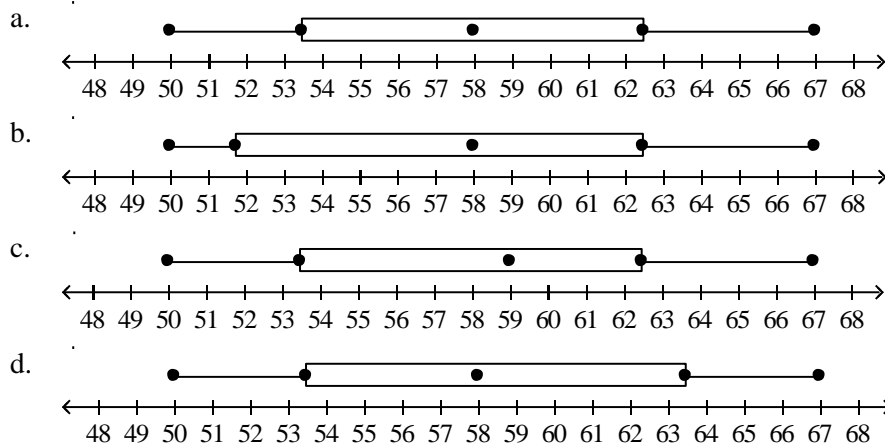
What are the minimum, first quartile, median, third quartile, and maximum of the data set?

65. 60, 50, 130, 200, 180, 150, 100, 140
- minimum 50; first quartile 80; median 135; third quartile 165; maximum 200
 - minimum 50; first quartile 107.5; median 150; third quartile 182.5; maximum 200
 - minimum 50; first quartile 80; median 135; third quartile 182.5; maximum 200
 - minimum 50; first quartile 65; median 150; third quartile 165; maximum 200

Make a box-and-whisker plot of the data.

66. average daily temperatures in Tucson, Arizona, in December:

67, 57, 52, 51, 64, 58, 67, 58, 55, 59, 66, 50, 57, 62, 58, 50, 58, 50, 60, 63



Is each data set *qualitative* or *quantitative*?

67. favorite sports teams
- qualitative
 - quantitative

Is each data set *univariate* or *bivariate*?

68. the number of hours surfing the web by students at your school
- univariate
 - bivariate

Identify the sampling method.

69. You want to determine the number of text messages students at your school make in a month. You randomly ask everyone in each of your classes.
- random
 - systematic
 - stratified
 - none of these
70. You want to find how many students use public transportation. You interview every fifth teenager you see exiting a movie theater.
- random
 - systematic
 - stratified
 - none of these

**Algebra 1 Spring Semester Final Exam Review
Answer Section**

- | | |
|-------|-------|
| 1. A | 43. B |
| 2. B | 44. C |
| 3. A | 45. C |
| 4. A | 46. D |
| 5. D | 47. B |
| 6. C | 48. C |
| 7. B | 49. A |
| 8. A | 50. A |
| 9. D | 51. B |
| 10. B | 52. C |
| 11. B | 53. B |
| 12. B | 54. A |
| 13. A | 55. C |
| 14. C | 56. C |
| 15. C | 57. C |
| 16. C | 58. C |
| 17. A | 59. A |
| 18. A | 60. A |
| 19. C | 61. C |
| 20. B | 62. B |
| 21. C | 63. B |
| 22. A | 64. C |
| 23. B | 65. A |
| 24. B | 66. A |
| 25. D | 67. A |
| 26. D | 68. A |
| 27. A | 69. C |
| 28. C | 70. B |
| 29. C | |
| 30. D | |
| 31. A | |
| 32. C | |
| 33. B | |
| 34. D | |
| 35. C | |
| 36. B | |
| 37. B | |
| 38. C | |
| 39. B | |
| 40. D | |
| 41. B | |
| 42. B | |