Grade 7

Summative Assessment

1. The probability that a student attending Clearview Middle School lives within 3 miles of the school is $\frac{8}{9}$. Which of the following is the best interpretation of this probability?

A. It is likely that a student attending Clearview Middle School lives within 3 miles of it.

B. It is neither likely nor unlikely that a student attending Clearview Middle School lives within 3 miles of it.

C. It is unlikely that a student attending Clearview Middle School lives within 3 miles of it.

D. It is likely that a student attending Clearview Middle School lives within $\frac{8}{9}$ mile of it.

2. Li-Hua wants to create a triangular frame. She has two pieces of wood, which are 6 inches long and 9 inches long, to use for two sides of the triangle. Which of the following **cannot** be the length of the third side of the frame?

A. 4 inches

B. 6 inches

C. 13 inches

D. 16 inches

3. Evaluate: $12 + (-12)$

A. -24

B. 0

C. 12

D. 24

4. Which of the following is the formula for the volume of a cube with edge length e?

A. $V = e^2$

B. $V = 6e^2$

C. $V = e^3$

D. $V = 6e^3$

5. Simplify: $3a + b + a - 5$

A. $3a + b - 5$

B. $3a^2 - 5b$

C. $4a - 4b$

D. $4a + b - 5$

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6. According to statistics for Richard's home state, the probability, expressed as a decimal, that he will get a cavity in the next 5 years is 0.45. Which of the following is the best interpretation of this probability?

A. It is likely that Richard will get a cavity in the next 5 years.

B. It is neither likely nor unlikely that Richard will get a cavity in the next 5 years.

C. It is unlikely that Richard will get a cavity in the next 5 years.

D. It is likely that Richard will get a cavity 10 years from now.

7. Evaluate: $\frac{1}{3}\left(-15+\frac{3}{2}\right)$

A. $-5\frac{1}{2}$

B. $-4\frac{1}{2}$

C. $4\frac{1}{2}$

D. $5\frac{1}{2}$

8. Which of the following expressions represents the distance between -12 and -5 on a number line?

A. $|-12-(-5)|$

B. $|-12-5|$

C. $|-12+(-5)|$

D. $|12+5|$

9. Marilyn's recipe for lemonade calls for $\frac{3}{4}$ cup of sugar for every $\frac{1}{2}$ cup of lemon juice. Which of the following equations represents the relationship of cups of lemon juice to cups of sugar in Marilyn's recipe? Let s = cups of sugar and l = cups of lemon juice.

A. $l=\frac{3}{8}s$

B. $l=\frac{2}{3}s$

C. $l=1\frac{1}{2}s$

D. $l=3\frac{2}{3}s$

10. Mr. Borkowski ordered 3 boxes of pens for the supply room. There are 12 pens in each box. If there are now a total of 96 pens in the supply room, including the ones Mr. Borkowski added, how many boxes of pens were already in there before his order arrived?

A. 5

B. 6

C. 8

D. 11

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11. What is the value of the expression below?

$10 \div 0$

A. 0

B. 1

C. 10

D. undefined

12. Evaluate: $\frac{5}{6} - \frac{1}{3} - \frac{5}{6}$

A. $-\frac{1}{2}$

B. $-\frac{1}{3}$

C. $\frac{1}{3}$

D. $\frac{4}{3}$

13. The Johnson family's land has an area of $3\frac{1}{2}$ acres. Their house covers an area of $\frac{1}{8}$ acre. In simplest form, what is the ratio of the area of the Johnson family's house to the total area of their land?

A. $\frac{1}{28}$

B. $\frac{1}{20}$

C. $\frac{1}{12}$

D. $\frac{7}{16}$

14. Cecilia wants to know what percent of the seventh-grade students at her school are bilingual. She surveyed a random sample of seventh- and eighth-grade students at her school. Which of the following best explains why this sample is or is not representative of the population Cecilia wants to study?

A. The sample is representative, because it is a random sample.

B. The sample is not representative, because it is a random sample.

C. The sample is not representative, because it includes eighth-grade students.

D. The sample is not representative, because it does not include every seventh-grade student in the school.

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15. Uri recorded the local daily high temperatures for 7 randomly chosen days in July and 7 randomly chosen days in August, as shown below.

Daily High Temperatures (in degrees Fahrenheit)

July	95	89	85	90	85	91	88
August	96	84	93	90	88	98	95

Based on the means of these sets of data, which of the following is a reasonable conclusion?

A. On average, the daily high temperatures were the same in July and August.

B. On average, the daily high temperatures were higher in July than in August.

C. On average, the daily high temperatures were higher in August than in July.

D. There was greater variability in the daily high temperatures in July than in August.

16. Risa found the value of the expression $(-8 + 0 + 13)$ using the steps shown below.

$$-8 + 0 + 13$$

$$-8 + 13 \qquad \text{Step 1}$$

$$5 \qquad \text{Step 2}$$

Which property did Risa use in Step 1?

A. identity property of addition

B. associative property of addition

C. commutative property of addition

D. distributive property

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17. Which of the following tables represents a proportional relationship between x and y?

A.

x	y
−4	−1
−3	−2
−2	−3
−1	−4

B.

x	y
−2	−10
0	0
1	5
3	15

C.

x	y
−1	1
0	0
1	1
2	4

D.

x	y
2	8
3	12
6	16
10	20

18. In $2\frac{1}{4}$ hours, Nick wrote 36 text messages. What was his unit rate during that time?

A. 14 messages per hour

B. 16 messages per hour

C. 34 messages per hour

D. 81 messages per hour

19. Charlotte has a success rate of about 20% for making baskets in attempts during basketball games. She wants to determine the probability that she will have to make at least 5 attempts during a game in order to make a basket. She designed a simulation where she spun a spinner that was divided into 5 equal sections, one of which was colored red. She counted how many times she had to spin the spinner in each trial before it landed on red. The results of her 20 trials are shown below.

5, 2, 7, 2, 3, 4, 10, 6, 4, 6,
3, 6, 6, 4, 8, 5, 7, 7, 1, 5

According to this simulation, what is the probability that Charlotte will have to make at least 5 attempts in order to make a basket?

A. $\frac{1}{5}$

B. $\frac{2}{5}$

C. $\frac{3}{5}$

D. $\frac{4}{5}$

20. Evaluate: $3\frac{3}{4} \div 5$

A. $\frac{3}{8}$

B. $\frac{3}{4}$

C. $1\frac{1}{3}$

D. $3\frac{3}{20}$

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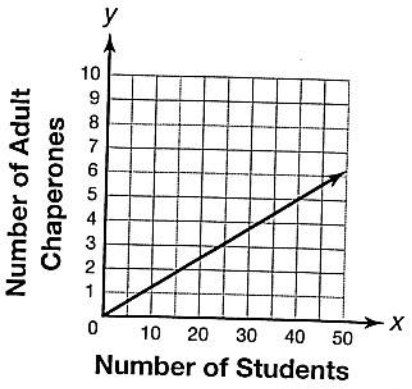
21. A school principal requires a certain number of adult chaperones on a field trip, depending on the number of students, as shown in the graph below.



Which of the following best describes this relationship?

A. The number of adult chaperones is always 35 fewer than the number of students.

B. The ratio of adult chaperones to students is always $\frac{8}{1}$.

C. The ratio of adult chaperones to students is always $\frac{1}{5}$.

D. The ratio of adult chaperones to students is always $\frac{1}{8}$.

22. Henry wrote the names of his classmates on slips of paper and put them in a bag. He repeatedly drew a piece of paper, recorded the first letter in the name, and returned the piece of paper to the bag. The results of his experiment are shown below.

N, A, K, A, C, L, L, P, N, V, M, A

Based on this data, what is the experimental probability that a student chosen at random from the class has a name starting with the letter A?

A. $\frac{1}{8}$

B. $\frac{1}{6}$

C. $\frac{1}{4}$

D. $\frac{1}{3}$

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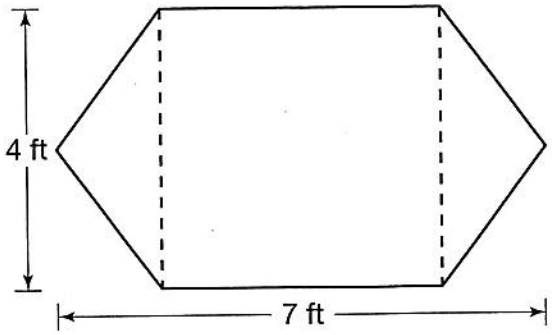
23. A pedestal for a statue is in the shape of a hexagon, formed by a square and two congruent triangles, with the dimensions shown below.



What is the area of the top surface of this pedestal?

A. 19 square feet

B. 22 square feet

C. 25 square feet

D. 28 square feet

24. A grocery store manager took a random sample of 10 apples from a supplier's delivery and weighed them. The weights, in pounds, are shown below.

0.5, 0.4, 0.6, 0.7, 0.5,
0.2, 0.3, 0.2, 0.4, 0.2

Based on this sample, which of the following is a reasonable inference to make about the supplier's apples?

A. A shopper will buy, on average, less than 1 pound of apples.

B. The range of weights of apples from the supplier is greater than 0.5 pound.

C. The mean weight of an apple from the supplier is 0.2 pound.

D. The mean weight of an apple from the supplier is 0.4 pound.

25. Which of the following could **not** represent the intersection of a plane and a square-based pyramid?

A. a triangular prism

B. a triangle

C. a square

B. a point

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26. The height of the scale drawing of a floor lamp shown below is 8 centimeters.

Scale: 2 cm = $1\frac{1}{2}$ ft

What is the height of the actual floor lamp?

A. $4\frac{1}{2}$ feet

B. 6 feet

C. $10\frac{2}{3}$ feet

D. 12 feet

27. Evaluate: $-\frac{4}{5} \cdot -\frac{3}{8} \cdot \frac{5}{4}$

A. $-\frac{3}{8}$

B. $-\frac{3}{40}$

C. $\frac{3}{40}$

D. $\frac{3}{8}$

28. Jared has a spinner with equally sized sections labeled A, B, and C. He spun the spinner 15 times, with the following results.

C, B, B, C, A, C, B, C, C, A, B, C, B, C, C

Based on the results of this experiment, about how many times can Jared expect the spinner to land on C in an experiment of 300 spins?

A. 100

B. 130

C. 160

D. 240

29. Mrs. Lewis's outdoor thermometer has a 2% margin of error, which means that the temperature displayed on the thermometer could be up to 2% lower or higher than the actual outdoor temperature. If Mrs. Lewis's thermometer reads 85.0°F (degrees Fahrenheit), what is the range of possible actual outdoor temperatures?

A. 83.0°F to 87.0°F

B. 83.3°F to 86.7°F

C. 84.3°F to 86.7°F

D. 84.8°F to 85.2°F

Summative Assessment

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30. A soup kitchen cooks up a total of 200 cups of soup. If their standard serving size is $2\frac{1}{2}$ cups, how many servings can they hand out, at most?

A. 50

B. 80

C. 150

D. 500

31. Simplify: $4x\left(x^2 - 3x + \frac{1}{2}\right)$

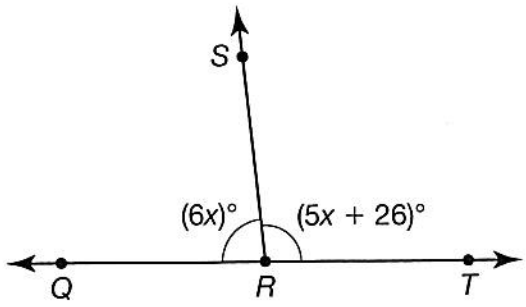
A. $-8x^2 + 2x$

B. $4x^3 - 12x^2 + \frac{1}{2}x$

C. $4x^3 - 12x^2 + 2x$

D. $4x^3 + x + \frac{1}{2}$

32. In the figure below, $\angle QRS$ and $\angle SRT$ are supplementary.



What is $m\angle SRT$?

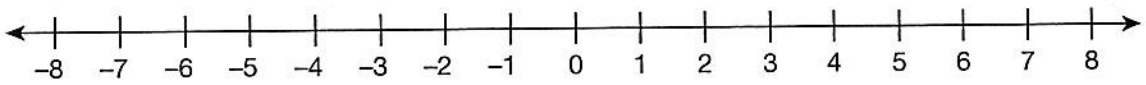
A. 70°

B. 84°

C. 96°

D. 156°

33. A number line is shown below.



What is the value of $(-3 + 5)$?

A. -8

B. -2

C. 2

D. 8

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34. The number of 1-cup servings in a bottle of juice is proportional to the number of ounces of juice in the bottle. There are 8 ounces in each 1-cup serving. Which of the following equations represents the relationship between the number of servings, s, and number of ounces, n, in a bottle of juice?

A. $n = s - 8$

B. $s = n - 8$

C. $n = \frac{1}{8}s$

D. $s = \frac{1}{8}n$

35. Greta recorded the ages of male and female actors represented by a certain agent. The ages, in years, are shown below.

Male Actors: 26, 32, 38, 35, 42, 31

Female Actors: 26, 25, 30, 27, 28, 32

Based on Greta's data, which of the following statements is true?

A. The mean age of the female actors is 6 years greater than the mean age of the male actors. The mean absolute deviation for ages of female actors is about twice the mean absolute deviation for ages of male actors.

B. The mean age of the female actors is 6 years greater than the mean age of the male actors. The mean absolute deviation for ages of female actors is about $\frac{1}{2}$ the mean absolute deviation for ages of male actors.

C. The mean age of the male actors is 6 years greater than the mean age of the female actors. The mean absolute deviation for ages of male actors is about $\frac{1}{2}$ the mean absolute deviation for ages of female actors.

D. The mean age of the male actors is 6 years greater than the mean age of the female actors. The mean absolute deviation for ages of male actors is about twice the mean absolute deviation for ages of female actors.

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36. A circular tabletop has a diameter of 6 feet. What is the area of the tabletop?

A. 6π square feet

B. 9π square feet

C. 12π square feet

D. 36π square feet

37. Evaluate: $-\frac{2}{5}\left(5-\frac{1}{2}\right)$

A. $-2\frac{1}{5}$

B. $-1\frac{4}{5}$

C. -1

D. $2\frac{1}{5}$

38. Arthur has a coin on which he has written the number 1 on one side and the number 2 on the other side. He created the table below to show all the possible outcomes for flipping this coin and rolling a 6-sided number cube with faces labeled 1 through 6.

	1	2	3	4	5	6
1	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)
2	(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)

Arthur wants to find the probability that both the coin and the number cube will land on an even number. Which of the following represents the complete list of favorable outcomes for this experiment?

A. (2, 2)

B. (2, 2), (2, 4), (2, 6)

C. (2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6)

D. (1, 2), (1, 4), (1, 6), (2, 2), (2, 4), (2, 6)

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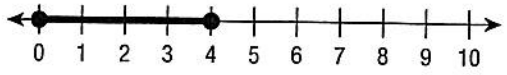
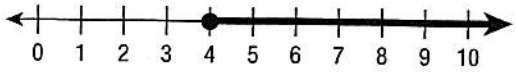
39. Lisa can spend up to \$50 at the hardware store. She is buying a paintbrush and paint rollers for a total of \$18. The paint she wants to buy costs \$8 per gallon. Which of the following graphs represents the possible number of gallons of paint Lisa can buy?

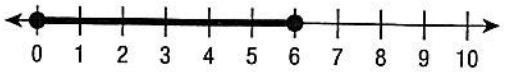
A.



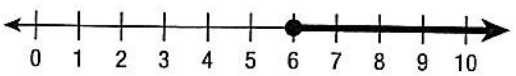
B.



C.



D.



40. Mr. Pace assigned each of his students a topic for either a written report or an oral presentation. For each student, he randomly chose one of the following vertebrate groups: mammals, fish, birds, reptiles, or amphibians. He flipped a coin to determine whether the assignment would be a written report or an oral presentation. What is the probability that Josh will be assigned an oral presentation on either reptiles or fish?

A. $\frac{1}{10}$

B. $\frac{1}{5}$

C. $\frac{2}{7}$

D. $\frac{2}{5}$

41. The price of a ticket to the circus this year is 10% more than the price of a ticket to the circus last year. If the variable t represents the ticket price for the circus last year, which of the following methods will produce the ticket price for the circus this year?

A. subtract 10 from t

B. add 10 to t

C. multiply t by 0.1

D. multiply t by 1.1

42. Which of the following is the decimal equivalent of $\frac{5}{6}$?

A. 0.56

B. 0.82

C. $0.8\overline{3}$

D. 1.2

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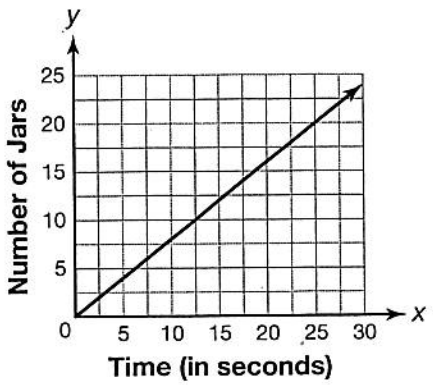
43. The graph below represents the number of jars a machine fills in various amounts of time, at a factory.



What does the point (15, 12) on this graph represent?

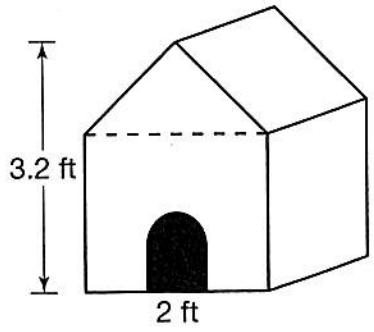
A. The machine fills 15 jars in 12 seconds.

B. The machine fills 12 jars in 15 seconds.

C. The machine fills 15 jars in 12 minutes.

D. The machine fills 12 jars in 15 minutes.

44. A doghouse is in the shape shown below, composed of a cube and a triangular prism.



What is the volume of the doghouse?

A. 9.2 cubic feet

B. 10.4 cubic feet

C. 12.8 cubic feet

D. 14.4 cubic feet

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45. Omar designed an experiment where he spins a spinner with 4 equal sections labeled A, B, C, and D and then tosses a coin that is painted green on one side and red on the other side. Let G = green and R = red. Which of the following tables represents the sample space for Omar's experiment?

A.

Spinner	Coin	Outcome
A	G	AG
B	G	BG
C	G	CG
D	G	DG

B.

Spinner	Coin	Outcome
A	G	AG
B	R	BR
C	G	CG
D	R	DR

C.

Spinner	Coin	Outcome
A	G	AG
A	R	AR
B	G	BG
B	R	BR
C	G	CG
C	R	CR
D	G	DG
D	R	DR

D.

Spinner	Coin	Outcome
A	G	AG
B	R	BR
C	G	CG
D	R	DR
E	G	EG
F	R	FR
G	G	GG
H	R	HR

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46. Mr. Knowles is shopping for a dishwasher and likes a model from this year that costs $409.95. A salesperson tells him that he can save 9% by buying the previous year's model. Mr. Knowles calculates that he can save $3.69 by buying the previous year's model. Which of the following best explains why this is or is not a reasonable answer?

A. This is a reasonable answer. The number 409.95 is close to 400 and 9% is close to 0.01, so 9% of 409.95 is close to 0.01 × 400, or 4.

B. This is not a reasonable answer. The number 409.95 rounds up to 500 and 9% rounds up to 10%, so 9% of 409.95 is close to 10% of 500, or 50.

C. This is not a reasonable answer. The number 409.95 rounds to 410 and 9% is close to 10, so 9% of 410 is close to 410 − 10, or 400.

D. This is not a reasonable answer. The number 409.95 is close to 400 and 9% is close to 10%, so 9% of 409.95 is close to 10% of 400, or 40.

47. A spinner is divided into 8 congruent sections labeled 1 through 8. If Sari spins the spinner once, what is the probability that it will land on a multiple of 3?

A. $\frac{1}{4}$

B. $\frac{1}{3}$

C. $\frac{3}{8}$

D. $\frac{3}{4}$

48. A cereal box contains $8\frac{1}{4}$ cups of cereal. The nutritional information on the box defines a serving as $\frac{3}{4}$ cup. How many servings does this box contain?

A. $6\frac{3}{16}$

B. $7\frac{1}{2}$

C. 11

D. 27

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49. Bob performed an experiment in which he tossed a regular tetrahedron (a polyhedron with 4 congruent faces) with faces labeled 1 through 4. The theoretical probability of the tetrahedron landing on the number 1 is $\frac{1}{4}$. Bob tossed the tetrahedron 8 times, with the following results.

2, 4, 4, 3, 2, 3, 1, 4

The experimental probability of the tetrahedron landing on 1 is only half the theoretical probability of the tetrahedron landing on 1. Which of the following best explains this discrepancy?

A. There were not enough trials in Bob's experiment. Generally, the greater the number of trials, the closer the experimental probability will be to the theoretical probability.

B. The faces of the tetrahedron are different sizes.

C. Fewer faces on the tetrahedron are labeled 1 than are labeled 2, 3, or 4.

D. Bob incorrectly recorded the results of his experiment.

50. Jay recorded the finishing times of 10 randomly selected runners from each of two races, a 2-kilometer race and a 5-kilometer race. The times, in minutes, are shown below.

2-Kilometer Race: 9.8, 12.2, 10.0, 8.7, 9.2, 10.3, 7.8, 9.7, 11.4, 10.9

5-Kilometer Race: 21.0, 26.3, 29.5, 25.2, 24.7, 20.6, 26.9, 22.5, 24.3, 29.0

Based on the interquartile ranges of these two sets of data, which of the following is a reasonable conclusion concerning finishing times in the two races?

A. There was a greater variability of finishing times for the middle 50% of the 5-km race runners than for the middle 50% of the 2-km race runners.

B. There was a greater variability of finishing times for the middle 50% of the 2-km race runners than for the middle 50% of the 5-km race runners.

C. The variability of finishing times for the middle 50% of the runners was the same for the 2-km race as for the 5-km race.

D. The average speed, in kilometers per hour, was faster for runners in the 2-km race than for runners in the 5-km race.

STOP