2024

Summer Math Packet

Entering Algebra

This packet encompasses the skills you learned in 7th grade and will help ensure you are prepared to enter 8th grade in September. Make sure to read the directions for each question carefully. You **MUST** show all your work for your effort grade. If you do your work on another sheet of paper, make sure to attach that to the end of the packet when you hand it to your teacher in September.

You will receive ***two grades*** for the math packet for the new school year so make sure to do your best! One grade is based on effort and the other is accuracy. Effort is showing your work and it is completed. Accuracy is the amount correct.

Due Date: Monday, September 9th, 2024

Good luck and have a wonderful summer!

The Math Department

Name _____

Grade **7A**
Progress Monitoring
Assessment Form C

1. Which expression is equivalent to $(5^4)^2 \cdot 5^{-4}$?

A. $5^{16} \cdot 5^{-4}$

B. $5^6 \cdot 5^{-4}$

C. $(\frac{1}{5})^4$

D. $5^2 \cdot (\frac{1}{5})^{-2}$

2. Jonah walks $\frac{1}{3}$ mile in $\frac{3}{4}$ hour. How fast, in miles per hour, does he walk?

A. $\frac{1}{4}$ mile per hour

B. $\frac{4}{9}$ mile per hour

C. $2\frac{1}{4}$ miles per hour

D. $2\frac{4}{9}$ miles per hour

3. Alaina surveys 75 of her classmates and finds that 48% of them like to eat tacos. She also finds that 60% of her 45 relatives like tacos. How many more of her classmates like tacos as compared to her relatives?

A. 9
B. 12
C. 30
D. 36

4. Jed is pouring water into a container at a constant rate of 8.25 ounces per second. There are already 24.75 ounces of water in a container. How many ounces of water will be in the container after 5 seconds?

A. 29.75 ounces
B. 33 ounces
C. 49.5 ounces
D. 66 ounces

5. A game has a spinner with 4 equal-sized sections. The results of 540 spins are shown in the table.

Color	Frequency
Red	145
Blue	111
Yellow	178
Orange	106

Part A

For which color is the experimental probability closest to the theoretical probability? Explain.

Part B

For which color is the difference between the theoretical probability and experimental probability greatest? Explain.

5. The side lengths of different triangles are given. Which triangle is a right triangle?

A. 7, 9, 14

B. 3.5, 10.5, 12.5

C. $\sqrt{18}, \sqrt{7}, 6$

D. $\sqrt{24}, \sqrt{40}, 4$

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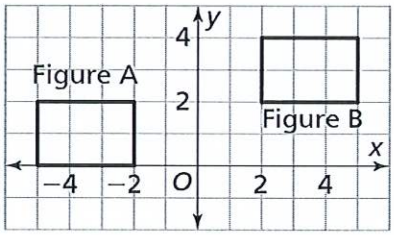
7. Describe a sequence of transformations that maps Figure A to Figure B.



Word Bank: x-axis, up, rotation, y-axis, dilation, reflection, translation, down

Fill in the blank.

A _____ across the

_____ and

_____ 2 units

_____.

8. The mass of the Earth is about 5.97×10^{24} kg. The mass of Jupiter is about 1.898×10^{27} kg. Approximately how many times more massive is Jupiter than Earth?

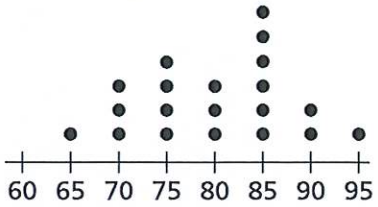
A. 3,180 times

B. 318 times

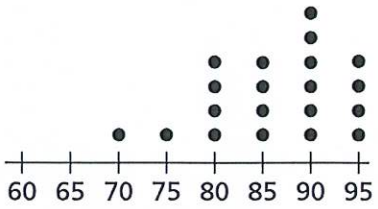
C. 31.8 times

D. 3.18 times

9. The dot plots describe quiz scores.



Third-Period Class



Fourth-Period Class

Part A

Form a valid inference based on the means of the data sets.

A. On average, the students in the fourth-period class scored lower as compared to students in the third-period class.

B. On average, the students in the fourth-period class scored the same as students in the third-period class.

C. On average, the students in the fourth-period class scored higher as compared to students in the third-period class.

Part B

Select the statement that best describes the variability of the data sets.

A. The MAD for the fourth-period class is about $\frac{1}{2}$ the MAD for the third-period class.

B. The MAD for the fourth-period class is greater than the MAD for the third-period class.

C. The MAD for the third-period class is about twice the MAD for the fourth-period class.

D. The MAD for the third-period class is greater than the MAD for the fourth-period class.

10. The surface area of a sculpture shaped like a sphere is 1,017.88 square inches. What is the approximate volume of the sculpture? Use 3.14 for π.

A. 9,160.98 $in.^3$
B. 3,053.63 $in.^3$
C. 339.29 $in.^3$
D. 68.55 $in.^3$

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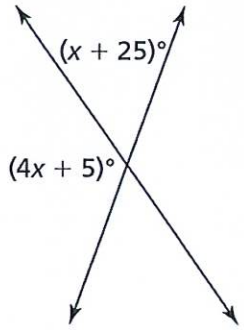
11. Two lines are intersecting. What is the value of x?



12. Xander's adult cat weighs 2,918 grams. As an 8-week old kitten, Xander's cat weighed 640 grams. What is the percent increase in the kitten's weight rounded to the nearest whole number?

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13. Simplify the following expression: $5(3x) - 3(7x - 2)$

A. $6x + 6$
B. $36x + 6$
B. $6 - 6x$
D. $6 - 36x$

14. Of all the seventh graders, 70% bought a school lunch yesterday. Ten trials of a simulation are conducted and the data are recorded below.

52461, 65709, 58324, 06381, 94381, 84947, 23046, 33789, 57802, 70633

The numbers 0 through 6 represent students who bought a school lunch yesterday and the numbers 7, 8 , and 9 represent students who did not.

Based on the simulated data, what is the probability that 3 or more of a group of students randomly selected will buy the same school lunch the next time it is offered?

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15. Camila is saving money to buy a 5-piece drum set that cost $360. She already has $80.00 saved and can earn the rest of the money by washing 20 cars. If m represents how much she earns for washing each car, which of the following equations can be solved to find how much Camila is paid for washing each car?

A. $20m - 80 = 360$

B. $m(20 + 80) = 360$

C. $360 - 80 = 20m$

D. $80 + m = 360$

16. Juan randomly surveys students in the seventh grade to learn about their favorite type of music. Of 30 respondents, 8 liked to listen to rap music.

Part A

Based on Juan's data, how many of the 150 students in seventh grade like to listen to rap music?

Part B

If Juan conducted his survey based on every 2nd student in an alphabetical list of seventh-grade students, are the results representative of the seventh grade? Select **all** the statements that apply to Juan's survey.

A. The sample is too large.

B. The sample is randomly selected.

C. The sample size is small.

D. The sample size is representative of seventh-grade students.

E. The sample is not randomly selected

17. A probability model includes $P(\text{orange}) = \frac{1}{4}$ and $P(\text{green}) = \frac{1}{6}$. Select all the probabilities that could complete the model.

- ☐ $P(\text{blue}) = \frac{1}{4}, P(\text{red}) = \frac{5}{12}$
- ☐ $P(\text{blue}) = \frac{1}{3}, P(\text{red}) = \frac{1}{4}$
- ☐ $P(\text{blue}) = \frac{1}{2}, P(\text{red}) = \frac{1}{12}$
- ☐ $P(\text{blue}) = \frac{2}{3}, P(\text{red}) = \frac{1}{12}$
- ☐ $P(\text{blue}) = \frac{5}{12}, P(\text{red}) = \frac{1}{6}$

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18. The graph of a function us a line that passes through points (1, -7) and (-3, -27). What is the equation of this function?

y = _____x - _____

19. Kim's uncle signs up for a 3-year loan with 3% simple interest to buy a car.

Part A

If Kim's uncle pays a total of $765 in interest, how much money did he initially borrow?

Part B

If the simple interest rate was 1% instead of 3%, how much would Kim's uncle save in interest?

20. The cost to rent a surfboard at the beach is $10.25 an hour plus an insurance fee of $25. Keith spent $55.75 when renting a surfboard on a recent trip to the beach. For how many hours did Keith rent the surfboard?

21. A fire hydrant with a blue cap provides water at a rate of 1,500 gallons per minute. A fire hydrant with an orange cap provides water at a rate of 500 gallons per minute. A fire hydrant with a green cap provides water at two-thirds the rate of a fire hydrant with a blue cap.

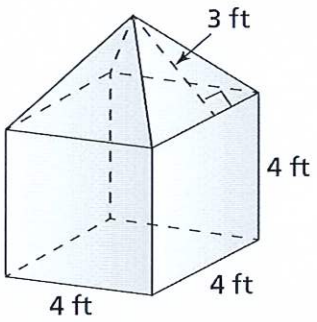
Part A

Write an equation to relate the flow of water from the blue hydrant, b, to the flow from the orange hydrant, r.

Part B

Write an equation to relate the flow of water from the green hydrant, g, to the flow of water from the blue hydrant, b.

22. Skip builds a new doghouse and wants to paint the outside of the square walls and triangular ceilings. What area does Skip paint?



23. Five boys and six girls enter a contest at a local sports venue. A randomly chosen winner will be awarded a free T-shirt, a free water bottle, or a free autographed poster. What is the probability that a girl will win a poster?

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

B. $\frac{2}{11}$

C. $\frac{5}{11}$

D. $\frac{6}{11}$

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24. Five-eighteenths of the students surveyed like to play basketball. Which decimal is equivalent to the fraction of students who like to play basketball?

A. 0.7

B. 0.27

C. $0.\overline{27}$

D. $0.2\overline{7}$

25. The entrance fee to a local waterpark is $34 per person. At the waterpark, you can rent a raft for $1.50 per hour. Which expression is equivalent to the amount it would cost Leah for h hours in the park if she rented a raft?

A. $1.50h + 34$

B. $1.50h - 34$

C. $1.50(h - 34)$

D. $1.50(h + 34)$

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26. Select all the statements that are true for the cross section of a rectangular prism.

- ☐ The cross section is a cube.
- ☐ The cross section is a rectangle.
- ☐ The vertical cross section is a triangle.
- ☐ The dimensions are the same as the faces of the solid that are parallel to the slice.
- ☐ The shape is the same as the faces of the solid that are parallel to the slice.

27. A family drives an average speed of 60 miles per hour on a trip from Pensacola to Orlando.

Part A

Write an inequality to show how many hours, h, the family must drive to travel the 438 miles to Orlando.

Part B

For how many hours must the family drive to travel the 438 miles?

28. A bike tire has a 16-inch diameter. How many complete revolutions will the bike make if it travels 100 feet? Round to the nearest whole revolution.

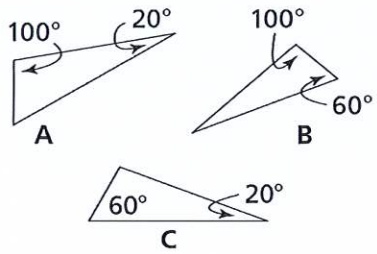
A. 2 revolutions **C.** 24 revolutions

B. 5 revolutions **D.** 51 revolutions

29. Select all of the statements that are true for a cone with radius r and height h.

- ☐ Doubling h doubles the volume.
- ☐ Doubling r doubles the volume.
- ☐ Doubling r quadruples the volume.
- ☐ Doubling h quadruples the volume.
- ☐ Doubling h and r quadruples the volume.

30. Which triangles are similar?



A. Triangles A and B are similar to each other.

B. Triangles A, B, and C are similar to each other.

C. Triangles A and C are similar to each other.

D. Triangles B and C are similar to each other.

31. A landscaper draws a blueprint of the newly landscaped backyard she is designing. The scale she uses is 1 inch = 5 feet. If the length of the backyard is 14 inches, and the width of the backyard is 10 inches, what are the actual dimensions of the backyard?

A. 14 feet in length by 10 feet in width

B. 50 feet in length by 70 feet in width

C. 70 feet in length by 50 feet in width

D. 70 feet in length by 70 feet in width

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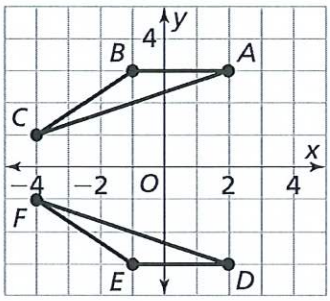
32. Select all of the statements that are true about the $\sqrt{5}$.

- ☐ $\sqrt{5}$ is an irrational number.
- ☐ $\sqrt{5}$ is a rational number.
- ☐ The approximate value of $\sqrt{5}$ is between 4 and 6.
- ☐ The approximate value of $\sqrt{5}$ is between 2 and 3.
- ☐ $\sqrt{5} < \sqrt{4}$

33. Triangle *DEF* is congruent to triangle *ABC*.



Part A

Which transformation maps $\triangle ABC$ onto $\triangle DEF$?

A. A reflection across a vertical line

B. a reflection across a horizontal line

C. A rotation about point *C*

D. a translation 2 units down

Part B

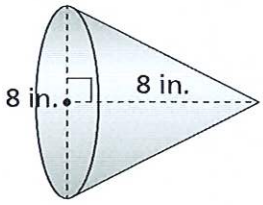
If $\triangle ABC$ is translated 1 unit right and 3 units down, what would the coordinates of $\triangle A'B'C'$ be?

A' (____, ____)

B' (____, ____)

C' (____, ____)

34. Mateo's candle mold is shown below.



Approximately how much wax does it take for Mateo to make one candle? Use 3.14 for π and round to the nearest cubic inch.

35. What is the value of x?

$$\frac{2}{5}x + \frac{1}{3}x = 6 + x - \frac{2}{3}x$$

36. The table represents different lengths of chain fencing and the total cost of each.

Length in feet	6	15	24	30
Total Cost	$42.00	$105.00	$168.00	$210.00

Part A

Select all of the statements which describe the relationship between these two quantities.

- ☐ The ratios in this table are not equivalent.
- ☐ The ratios in this table are equivalent.
- ☐ The two quantities in this table represent a proportional relationship.
- ☐ The two quantities in this table do not represent a proportional relationship.
- ☐ The graph of this relationship would be a straight line through the origin.

Part B

Identify the constant of proportionality.

37. Which expression is equivalent to the expression −6.4 − 12 + 4.6?

A. −(6.4 + 12 + 4.6)

B. 4.6 + 6.4 – 12

C. 4.6 − 6.4 – 12

D. 6.4 + (−12) + (−4.6)

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38. The temperature at 12:00 P.M. was 8°C. At 7:00 P.M., the temperature was –6°C. What was the change in temperature (in degrees Celsius)?

A. 6-degree increase
B. 14-degree increase
C. 6-degree decrease
D. 14-degree decrease

39. In the town of Destin, $\frac{2}{3}$ of the students in middle school participate in organized sports after school. If $\frac{3}{5}$ of the students who participate in organized sports after school play soccer, what fraction of the students play soccer?

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40. The size of a TV is the diagonal measurement of its screen. Will a 50-inch TV fit in a rectangular cabinet measuring 40 inches long and 32 inches high? Explain.