

SUMMER PACKET

Accelerated Algebra 1.5

2024-2025

Teacher: TBD

You may contact Mrs. Bennett (tbennett@gasd-pa.org) or Mr. Godack (sgodack@gasd-pa.org) for questions/concerns.

Welcome to Accelerated Algebra 1.5!

I. The problems in this packet are designed to help review the topics from previous mathematics courses that are important to your success in Accelerated Algebra 1.5. These can go as far back as 6th grade math. Please complete each problem, as they are topics you will need to know for the course AND your Algebra Keystone Exam.

II. Online resources you may use include, but are not limited to:

<http://www.purplemath.com>

<https://www.khanacademy.org/math/algebra>

You can use these sites to search by topic.

YouTube also has a lot of good videos.

III. The use of Apps, websites, etc. that solve math problems automatically are strictly prohibited.

IV. **Suggested Pacing:**

Below is a *suggested* time frame for completion. You may do the problems in any order that you wish.

Pages #3-6	End of June
Pages #7-9	End of July
Pages #10-13	August

V. Bring the *completed* summer packet to class on the **first day of school**, at which time the packet will be given credit. Write all work on the packet neatly. You may also use separate paper if organized.

VI. **Within the first week of school a test will be given on the material from the packet. Be prepared!**

VII. All math courses at the high school require the use of a graphing calculator. The teacher will model the use of the TI-83, TI-83+, TI-84, or TI-84+ model. You are free to purchase from a different company, or a different model. However, you will need to know how to use the brand you choose.

VIII. We will also utilize the Desmos Calculator. You can use this online or download the free “Desmos Test Mode” app on your smart phone. This is the calculator that is built in to the Algebra Keystone Exam.

Equations:

Solve each equation below. Show complete steps and write your answer in the blank at the right.

1. $3p + 7 - (-3) = p + (-2)$ 2. $12 - (2x + 5) = -2 + (x - 3)$ 1. _____

2. _____

3. $-(4y - 17) + (-y) = (2y - 1) - (-y)$ 4. $-3(2 - c) = c - 2$ 3. _____

4. _____

5. $-(6x - 5) = 4(7x - 8) + 3$ 6. $-(7 - 9)x - 6x = 8(-6 + 2)$ 5. _____

6. _____

7. The steps taken to correctly solve an equation are shown below, but one step is missing.

$$-2(x - 3) = -6(x + 4)$$

$$-2x + 6 = -6x - 24$$

?

$$4x = -30$$

$$x = -7.5$$

Which set of statements shows the equation that is **most likely** the missing step and the property that justifies the missing step?

- A. $4x - 6 = 24$ This step is justified by the additive property of equality.
 - B. $4x - 6 = 24$ This step is justified by the multiplicative property of equality.
 - C. $4x + 6 = -24$ This step is justified by the additive property of equality.
 - D. $4x + 6 = -24$ This step is justified by the multiplicative property of equality.
8. One of the steps Jamie used to solve an equation is shown below.

$$-5(3x + 7) = 10$$

$$-15x + -35 = 10$$

Which statements describe the procedure Jamie used in this step and identify the property that justifies the procedure?

- A. Jamie added -5 and $3x$ to eliminate the parentheses. This procedure is justified by the associative property.
 - B. Jamie added -5 and $3x$ to eliminate the parentheses. This procedure is justified by the distributive property.
 - C. Jamie multiplied $3x$ and 7 by -5 to eliminate the parentheses. This procedure is justified by the associative property.
 - D. Jamie multiplied $3x$ and 7 by -5 to eliminate the parentheses. This procedure is justified by the distributive property.
9. Victoria is solving the equation $\frac{2}{3}x - 3 = 4\frac{1}{5}$. Some of her steps are shown below.

· equation 1: $\frac{2}{3}x - 3 = 4\frac{1}{5}$

· equation 2: $\frac{2}{3}x - 3 = \frac{21}{5}$

· equation 3: $\frac{2}{3}x - 3 + 3 = \frac{21}{5} + 3$

Which statement correctly explains whether equation 3 in Victoria's work is valid in solving the equation?

- A. It is valid because $-3 + 3 = 0$.
- B. It is not valid because Victoria did not also add 3 to $\frac{2}{3}x$.
- C. It is not valid because Victoria should subtract 3 instead of adding 3.
- D. It is valid because Victoria added the same amount to each side of the equation.

10. Perform the indicated tasks.

- a. In the table below, identify the algebraic property that justifies each step of solving the equation $3(x - 2) = 5x$.

	$3(x - 2) = 5x$	Algebraic Property
equation 1:	$3x - 6 = 5x$	
equation 2:	$-6 = 2x$	
equation 3:	$-3 = x$	

- b. Show how to solve the equation $5(x - 2) = 10x + 20$ by first using the multiplicative property of equality and then using the additive property of equality.

11. Tony is solving the equation $4x = 12x + 20$ for x . Tony uses the multiplicative property of equality to rewrite the equation as $x = 3x + 20$. Which statement correctly explains whether Tony used the property correctly?

- A. Tony used the property correctly because he multiplied every term containing x by $\frac{1}{4}$.
- B. Tony used the property correctly because he multiplied one term on each side of the equals sign by $\frac{1}{4}$.
- C. Tony did not use the property correctly because he did not multiply every term on both sides of the equals sign by $\frac{1}{4}$.
- D. Tony did not use the property correctly because he should have multiplied both sides of the equals sign by $\frac{1}{12}$, not $\frac{1}{4}$.

12. Mr. Aziz is a sculptor. He makes sculptures either out of bronze or out of steel. He charges \$280 for each bronze sculpture he sells and \$440 for each steel sculpture he sells. Last year, he made 8 sculptures and sold all of them for a total of \$2,400. How many bronze sculptures did Mr. Aziz make last year? **Write & solve an equation.**

13. Marta purchased screws and nails at a hardware store. She paid \$0.10 for each screw and \$0.05 for each nail. She purchased 15 screws but did not count the number of nails she purchased. She paid a total of \$5.20 for the screws and nails. How many nails did Marta purchase? **Write & solve an equation.**

Pythagorean Theorem:

Use the Pythagorean Theorem to solve the following problems. Write & solve an equation to show your work.

14. Find the length of one leg of a right triangle if the length of the hypotenuse is 35 feet and the length of the other leg is 22 feet. Round to the nearest tenth.
15. Suppose a carpenter measures along one side of a deck, a distance of 9ft, and along the adjacent side, a distance of 12ft. The measure of the third side is 15ft. Is the corner of the deck square? Show & explain.
16. The radio tower shown is 130 meters tall. Four support wires are attached 10 meters from the top of the tower. The wires are attached to concrete anchors 50 meters from the base of the tower. How much wire is needed for all four support wires?

Probability:

Find the probability for each problem below. Show your calculations.

7. A bowl contains 5 red chips, 7 blue chips, 6 yellow chips, and 10 green chips. One chip is randomly drawn.
- Find $P(\text{blue})$
 - Find $P(\text{not green})$
18. The Uptown Deli offers a lunch special in which you can choose a sandwich, a side dish, and a beverage. If there are 10 different sandwiches, 12 different side dishes, and 7 different beverages from which to choose, how many different lunch specials can you order?
19. The weather forecast for the weekend calls for a 40% chance of rain on Saturday and an 80% chance of rain on Sunday. What is the probability that it will rain on both Saturday and Sunday?
20. A bag contains 8 red marbles, 9 yellow marbles, and 11 green marbles. Three marbles are randomly drawn from the bag and not replaced. Find the probability if the marbles are drawn in order. $P(\text{red, yellow, green})$
21. A bookstore manager will randomly select 1 of 5 newly arrived fiction books and 1 of 4 newly arrived nonfiction books for a window display. What is the probability that the manager will select the shortest of the newly arrived fiction books and the longest of the newly arrived nonfiction books? Write your answer as a percent.
22. A number cube with sides labeled 1 through 6 is rolled two times, and the sum of the numbers that end face up is calculated. What is the probability that the sum of the numbers is 3? Write your answer as a simplified fraction.

23. There are 28 students whose last names begin with the letters G, H, J, or K. Information about the probability of randomly selecting one of these students is listed below.

- probability of selecting a student whose last name begins with G: $\frac{1}{7}$
- probability of selecting a student whose last name begins with G or H: $\frac{5}{14}$

How many of these students have a last name that begins with H?

24. Mack, Nina, Samuel, and Tara play a board game. Each of them is equally likely to go first in the game. Also, each of them is equally likely to win the game. Winning the game is independent of going first. What is the probability Samuel goes first and wins the game? Write your answer in decimal form.

25. At a baseball game, 45% of the fans are wearing jackets. Also, 30% of the fans are wearing baseball caps. Whether a fan is wearing a jacket is independent of whether the fan is wearing a baseball cap. What is the probability that a randomly selected fan is **not** wearing a jacket and is wearing a baseball cap? Write your answer as a percent.

26. There are 14 boys and 6 girls in Emily's class. One student in Emily's class is chosen each day to hand out calculators to all the students. Also, one student in Emily's class is chosen each day to collect calculators at the end of class. The same student can be chosen for each job. Each student is equally likely to be chosen. What is the probability a girl is selected to do both jobs on Monday? Write your answer as a simplified fraction.

27. Artie has a book of short stories. The number of each type of short story is shown below.

- 6 science-fiction stories
- 4 adventure stories
- 3 historical stories
- 2 sports stories

He selects one short story at random. What is the probability that the story Artie selects is either a science-fiction story or an adventure story? Write your answer as a simplified fraction.

28. Maria is doing a probability experiment. She has a bag containing marbles of different colors. The probability of selecting each color of marble is given in the table below.

Marble Probabilities

Color	Probability of Selecting
blue	$\frac{1}{2}$
green	$\frac{1}{8}$
red	$\frac{5}{16}$
yellow	$\frac{1}{16}$

What is the probability that Maria randomly selects a green marble, replaces the marble, and then randomly selects a red marble? Write your answer as a simplified fraction.

29. There are 5 red marbles, 3 blue marbles, and 2 green marbles in a bag.

All marbles are returned to the bag.

All marbles are returned to the bag.

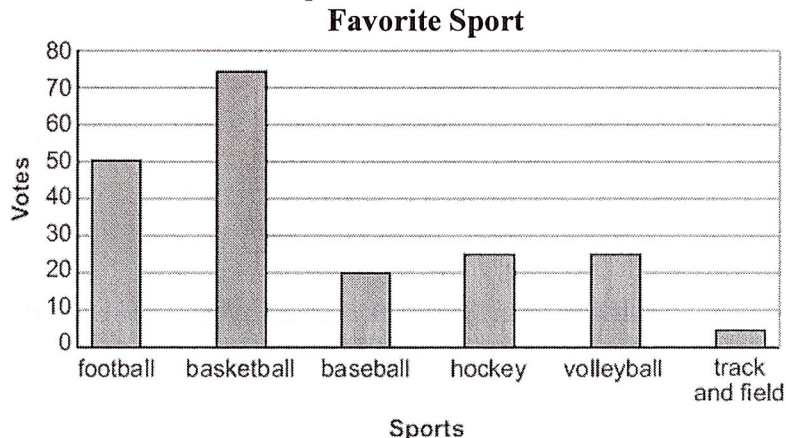
All marbles are returned to the bag.

- When 1 marble is selected at random from the bag, what is the probability that the marble is green?
- When 2 marbles are selected at the same time and at random from the bag, what is the probability that **neither** of the marbles are blue?
- When 2 marbles are selected at the same time and at random from the bag, what is the probability that exactly 1 of the marbles is red?
- Describe an event with selecting marbles at random from this bag where the probability is $\frac{1}{6}$.

Data Displays:

Use the data displays to answer each. Show your calculations.

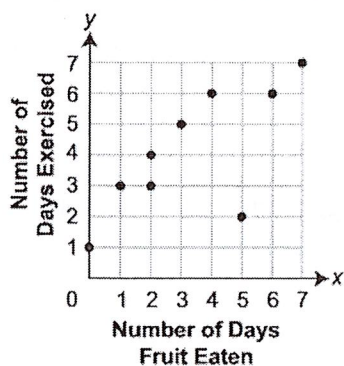
30. Vy asked 200 students to select their favorite sport and then recorded the results in the bar graph below.



Vy will ask another 80 students to select their favorite sport. Based on the information in the bar graph, how many more students of the next 80 asked will select basketball rather than football as their favorite sport?

31. Vaughn surveyed 9 classmates. He asked each classmate for the number of days in the previous week that he or she had eaten fruit and the number of days that he or she had exercised. The scatter plot below shows the results of his survey. What is the **median** number of days that the 9 classmates exercised last week?

Vaughn's Survey Results



33. The points scored by a football team are shown in the stem-and-leaf plot below.

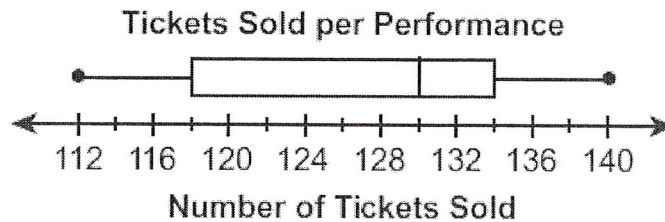
Football-Team Points

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

Key
1 3 = 13 points

What was the median number of points scored by the football team?

34. The cast of a play put on 12 performances. They sold more tickets for each performance than they sold for the performance immediately before it. The box-and-whisker plot below shows some information about the number of tickets sold for each performance.



For their first 3 performances, the cast sold 112, 114, and 116 tickets. How many tickets did they sell for their fourth performance?

35. Four violin students recorded the number of days they practiced violin each month for a year. Which stem-and-leaf plot has mode and median values that are equal?

A. **Number of Days
Practiced Each Month**

0	
1	1 1 4
2	1 1 1 1
3	1 1 1 1 1

Key	
1	2 = 12 days

C. **Number of Days
Practiced Each Month**

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

Key	
1	2 = 12 days

B. **Number of Days
Practiced Each Month**

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

Key	
1	2 = 12 days

D. **Number of Days
Practiced Each Month**

0	4 9
1	0 0 0 0 0 0
2	1 1
3	0 1

Key	
1	2 = 12 days

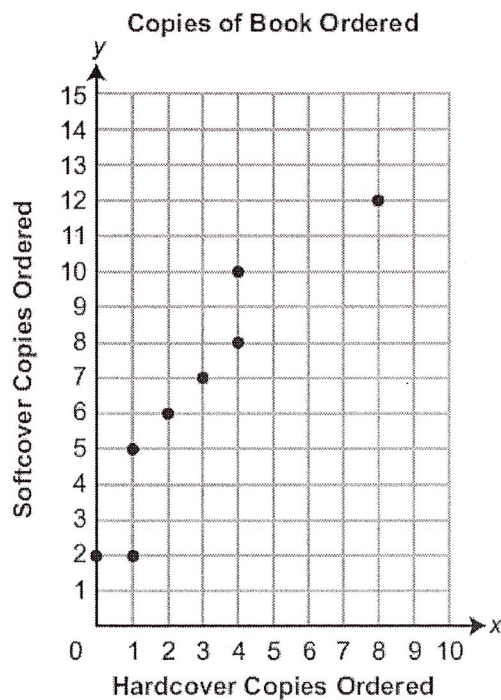
36. Lara asked 20 people how many coins each person had in his or her pockets. She used this data to calculate the measures of central tendency shown below.

- mean: 8.4
- median: 3.5

Which statement about the people Lara surveyed is **most likely** true?

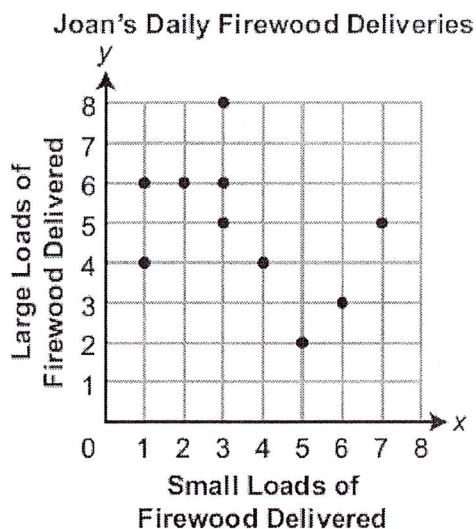
- A. Nobody had more than 12 coins in his or her pockets.
- B. Exactly 10 people had more than 8 coins in their pockets.
- C. The person who had the most coins in his or her pockets had at least 14 coins.
- D. The same number of people had exactly 3 coins in their pockets as had exactly 4 coins in their pockets.

37. Copies of a particular book were ordered by 8 bookstores last month. The scatter plot below shows the number of hardcover copies and the number of softcover copies that were ordered by each of the 8 bookstores last month.



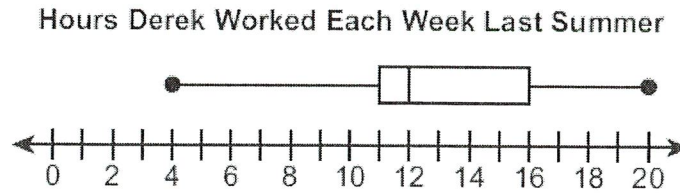
What is the mean number of copies of the book ordered by each bookstore?

38. Joan delivers small loads of firewood and large loads of firewood to a campground. The scatter plot below shows the number of small loads of firewood and the number of large loads of firewood she delivered on each of the last ten days.



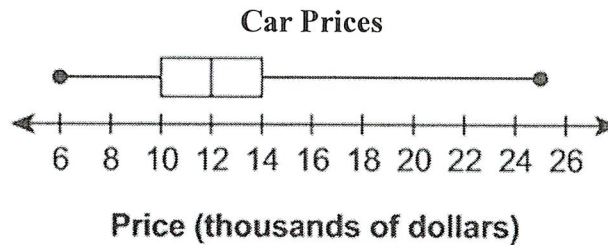
On how many of the last ten days did Joan deliver more than twice as many large loads of firewood as small loads of firewood?

39. Derek did yard work for 12 weeks last summer to earn extra money. He earned \$12 per hour. He worked a different number of hours each week. He recorded the number of hours he worked each week and used the data to make the box-and-whisker plot shown below.



In how many of the 12 weeks last summer did Derek earn more than \$192?

40. The box-and-whisker plot below represents the prices of all the cars for sale at a dealership.



Based on the box-and-whisker plot, which statement about the prices of the cars is **most likely** true?

- A. One-half of the cars are priced at \$12,000.
- B. All of the cars are priced no lower than \$10,000.
- C. One-half of the cars are priced between \$14,000 and \$25,000.
- D. One-fourth of the cars are priced between \$12,000 and \$14,000.

