Name: _____

2026-2027

King School Summer Math

Students Entering MAT 700

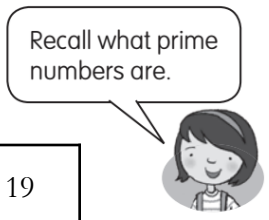
- **All work should be completed in this packet.**
- **Each problem should be clearly labeled with the problem number.**
- **Every answer should be circled.**
- **No final answers without supporting work will be accepted and will be required to be resubmitted.**
- **Please be sure to use notes from the previous years as well educational resources such as Khan Academy, IXL, etc.**
- **Working with a tutor on these exact problems is NOT permitted.**
- **Calculators and Photomath are NOT permitted.**

MAT 600 MATERIAL

- ◊ **Whole Numbers, Prime Numbers & Factorization**
  - o Prime Factorization
  - o Common Factors and Multiples
  - o Squares and Cubes
- ◊ **Fractions & Decimals**
  - o Dividing Fractions
  - o Real-World Problems: Fractions
  - o Adding and Subtracting Decimals Fluently
  - o Multiplying Decimals Fluently
  - o Dividing Decimals Fluently
  - o Real-World Problems: Decimals
- ◊ **Ratio**
  - o Comparing Two Quantities
  - o Equivalent Ratios
  - o Real-World Problems: Ratios
- ◊ **Rates & Speed**
  - o Rates and Unit Rates
  - o Real-World Problems: Rates and Unit Rates
  - o Distance and Speed
  - o Average Speed
- ◊ **Percent**
  - o Understanding Percent
  - o Fractions, Decimals and Percent
  - o Percent of a Quantity
  - o Real-World Problems: Percent
- ◊ **Algebraic Expressions**
  - o Using Letters to Represent Numbers
  - o Evaluating Algebraic Expressions
  - o Simplifying Algebraic Expressions
  - o Expanding and Factoring Algebraic Expressions
  - o Real-World Problems: Algebraic Expressions
- ◊ **Equations & Inequalities**
  - o Solving Algebraic Equations
  - o Writing Linear Equations
  - o Real-World Problems: Equations

Whole Numbers, Prime Numbers & Factorization

Section 1.1: Prime Factorization



1) Circle all the prime numbers.

1	3	5	7	9	11	13	15	17	19
21	23	25	27	29	31	33	35	37	39
41	43	45	47	49	51	53	55	57	59
61	63	65	67	69	71	73	75	77	79
81	83	85	87	89	91	93	95	97	99

Express each number as a product of its prime factors.

2) 360

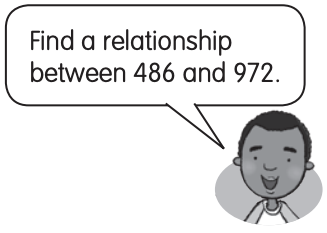
3) 595

_____

_____

Solve.

4) 486 is $2\times3\times3\times3\times3$ when written as a product of its prime factors. Write 972 as a product of its prime factors.



Section 1.2: Common Factors and Multiples

5) Find the factors of 27.

6) Find the factors of 81.

7) What are the common factors of 27 and 81?

Section 1.3: Squares and Cubes

Find the square of each number.

8) 8

9) 14

Find the cube of each number.

10) 7

11) 15

Find the value of each expression.

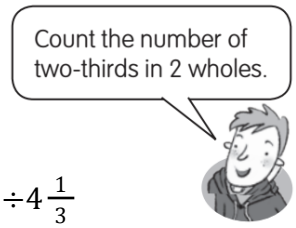
12) $8^3 - 5^2$

14) $10^3 + 8^2 - 5^3$

13) $22^2 \div 11^2$

15) $8^2 \div 2^3 + 7^3$

Fractions & Decimals



Section 3.1: Dividing Fractions

Divide. Write each quotient in simplest form. Circle your final answer.

16) $4 \div \frac{1}{5}$

17) $\frac{3}{5} \div 3$

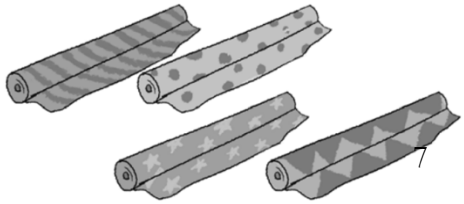
18) $2\frac{3}{5} \div 4\frac{1}{3}$

Section 3.2: Real-World Problems: Fractions

Solve.

19) Jenna has $4\frac{1}{2}\ yards$ of thread. She cuts the thread into equal pieces such that each piece measures $\frac{1}{4}\ yard$. How many pieces of thread does Jenna have?

20) Arianna has 4 sheets of wrapping paper. Each sheet of wrapping paper has an area of $4\ square\ feet$. Arianna cuts the sheet of wrapping paper into pieces that measure $\frac{1}{2}\ square\ foot$ each. How many cut pieces are there altogether?

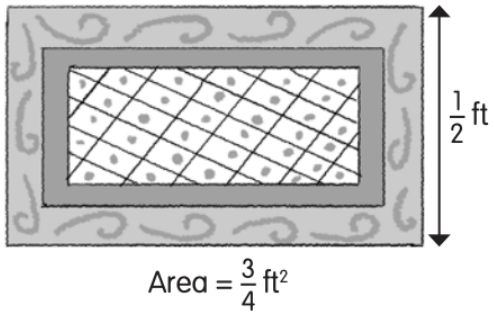


21) Ms. Morgan went for a vacation for 20 days. She spent $\frac{2}{5}$ of her vacation time in Asia and the rest in Europe. In Asia, she spent $\frac{1}{2}$ of her time in Thailand.

a. What fraction of her vacation time did Ms. Morgan spend in Thailand?

b. How many days did she spend in Thailand?

22) The area of a rectangular piece of cloth is $\frac{3}{4}$ $square\ foot$. The width of the cloth is $\frac{1}{2}$ $foot$. Find the length of the cloth.



23) In a factory, $2\frac{1}{10}$ bags of flour are needed to make a batch of cookies. The factory used $8\frac{2}{5}$ bags of flour yesterday. How many batches of cookies did the factory make yesterday?

Section 3.3: Adding and Subtracting Decimals Fluently

Write in vertical form. Then, subtract.

24) $34.656 - 12.92$

25) $67.89 - 23.498$

Section 3.4: Multiplying Decimals Fluently

Write in vertical form. Then multiply.

26) 12.8×0.4

29) 7.1×5.6

32) 0.25×6.9

27) 0.524×10

30) 5.82×0.78

33) 0.45×0.91

28) 0.89×0.3

31) $0.01 \times 0.167 \times 0.9$

34) 4.8×1.231

Section 3.5: Dividing Decimals Fluently

Divide. Write your final answer in the space provided.

35) $64 \div 0.32$

_____

36) $256 \div 0.4$

_____

37) $169 \div 0.13$

_____

38) $0.48 \div 0.06$

_____

39) $0.432 \div 0.16$

_____

40) $8.52 \div 1.2$

_____

Solve.

41) Given that $2.21 \div 1.3 = 1.7$, use this information to determine the value of the following.

a. $22.1 \div 1.3$

b. $2.21 \div 0.13$

c. $2.21 \div 0.17$

Section 3.6: Real-World Problems: Decimals

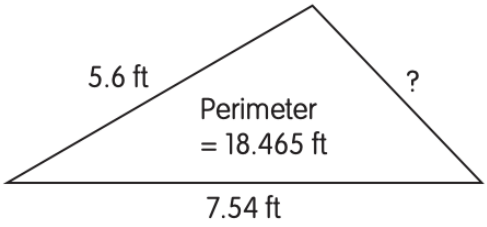
Solve.

42) A pound of beans costs $\$7.80$. Mr. Clark buys $6.5\ pounds$ of beans. How much does he pay for the beans?

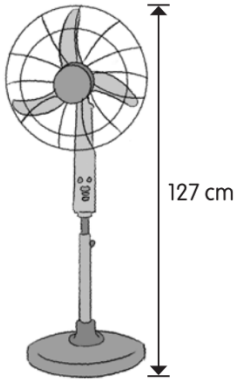


43) A store owner has $14.12\ pounds$ of salt. He stores the salt into 8 containers equally. How many pounds of salt are there in each container?

44) The perimeter of a triangular land plot is $18.465\ feet$. The lengths of two of its sides are $5.6\ feet$ and $7.54\ feet$. Find the length of the third side of the land plot.



45) The height of a standing fan is $127\ centimeters$. $1\ inch$ is $2.54\ centimeters$. What is the height of the standing fan in inches?



46) Ms. Taylor buys 8 picture books and 12 markers from a book store. The price of a book is $\$17.85$ and the price of a marker is $\$2.25$. Calculate the total amount Ms. Taylor spends.

Ratio

Section 4.1: Comparing Two Quantities

State whether each of the following can be expressed as a ratio.

47) $7\ gal$ and $5\ T$

48) $4\ yd$ and $80\ in$

Solve.

49) There are 94 apples in a box. 37 of them are red and the rest are green.

a. What is the ratio of the number of red apples to the number of green apples?

b. What is the ratio of the number of green apples to the total number of apples?

50) The number of meerkats is $\frac{5}{9}$ of the number of lemurs in a zoo.

a. Find the ratio of the number of meerkats to the number of lemurs.

b. Find the ratio of the number of meerkats to the total number of meerkats and lemurs.

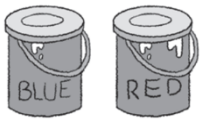
51) The length of a green ribbon is $8\ inches$ and the length of a blue ribbon is $24\ inches$.

a. How many times the length of the shorter piece is the longer piece?

b. What is the ratio of the length of the longer piece to the total length of the ribbons?

52) The ratio of the volume of blue paint to the volume of red paint is $8:7$.

a. Express the difference between the volume of the blue paint and the volume of red paint as a fraction of the total volume of blue and red paint.



b. Express the volume of blue paint as a fraction of twice the volume of red paint.

Section 4.2 Equivalent Ratios

Use division to find all whole number ratios equivalent to each of the following.

53) $8 : 36$

54) $12 : 52$

State whether each pair of ratios are equivalent.

55) $4 : 7$ and $24 : 42$

56) $9 : 6$ and $6 : 9$

57) $63 : 14$ and $18 : 4$

Express each ratio in its simplest form.

58) $32 : 64$

59) $3\ yd : 3\ ft$

60) $5\ hr : 52\ min$

Find the missing term of each pair of equivalent ratios.

61) $42 : 18 = \ ? \ : 3$

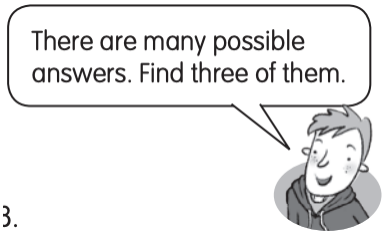
62) $48 : \ ? \ = 3 : 5$

? = _____

? = _____

Find the equivalent ratios.

63) Use multiplication to find three ratios equivalent to $6 : 13$.



Solve.

64) For every $5\ gallons$ of dye concentrate, $12\ gallons$ of water are added to make a dye solution.

a. Find the ratio of the number of gallons of dye concentrate to the number of gallons of water needed to make the dye solution.

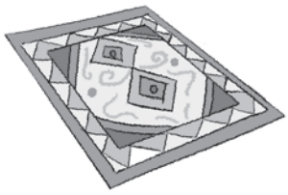
b. How many gallons of dye concentrate are used to make $68\ gallons$ of dye solution?

c. How many gallons of dye concentrate are used when $60\ gallons$ of water are added to make the dye solution?

Section 4.3: Real-World Problems: Ratios

Solve.

65) The cost of a carpet is $\$45$. Daniel and Sophia bought the carpet and share the cost in the ratio $4:5$. How much did Daniel pay for the carpet? Draw a bar model.



66) Mariah bought a packet of mixed nuts. The ratio of the weight of almonds to the weight of walnuts to the weight of pecans in ounces is $4 : 3 : 8$. The weight of pecans is 80 ounces.

a. Find the weight of the walnuts.



b. Find the total weight of the packet of mixed nuts.

67) At a party, the ratio of the number of adults to the number of children was $5 : 3$. Halfway through the party, 20 adults left and the ratio became $5 : 4$. How many children were there at the party?

68) Kyle and Claire bought a present and shared the cost in the ratio $3 : 8$. Claire paid $\$15$ more than Kyle. Find the total cost of the present. Draw a bar model to solve this problem.



69) The ratio for the amount of money Rachel saved to the amount of money Timothy saved was $12 : 13$. After Timothy spent $\$27$, Rachel had 3 times as much as Timothy.

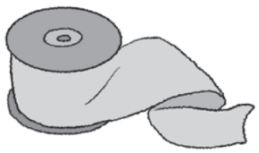
a. How much did Rachel save?

b. How much did they save altogether at first?

70) Evan, Luke, and Aidan sold magnets in the ratio $5 : 3 : 4$ to raise funds for their Scout troop. Luke sold 81 magnets. How many magnets did Evan and Aidan sell in all? Draw a bar model to solve this problem.



71) A 54 *inch* long ribbon is cut into 3 strips in the ratio $2 : 3 : 5$.



a. What is the length of the longest piece?

b. How much longer is the longest piece than the shortest piece?

c. What is the length of the shortest piece if they were cut in the ratio $1 : 2 : 3$?

Rates & Speed

Section 5.1: Rates and Unit Rates

Solve.

72) It takes 9 minutes for a flowing faucet to fill up a $27 - gallon$ tank. How much water flows from the faucet in $1\ minute$?

73) Ms. Hughes pays $\$2,191$ to stay one week in a hotel. How much does she pay per day?

74) Shop A sells chocolates at $\$24.20$ for a 14-ounce box and Shop B sells the same chocolates at $\$19.90$ for a 12-ounce box. Which shop has a better deal? Explain how you arrived at your answer. *Round your answers to* 2 *decimal places.*

Section 5.2: Real-World Problems: Rates and Unit Rates

Solve.

75) Water flowing from a faucet can fill $\frac{1}{4}$ of a tank in $5\ minutes$.

a. How long does it take to fill the tank completely with water?

b. How long does it take to fill 7 similar tanks completely with water? Give your answer in hours and minutes.

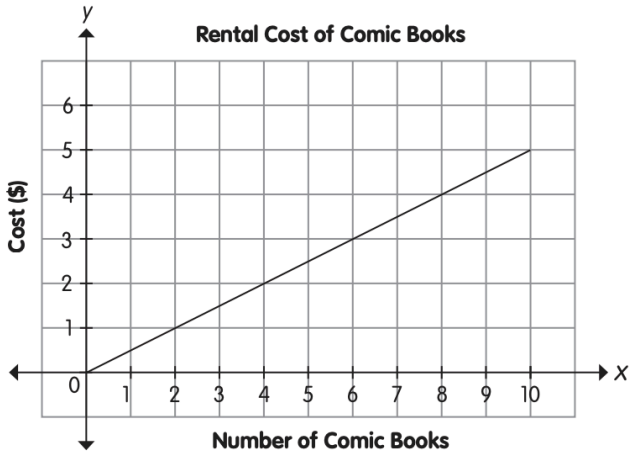
76) The table shows the cost of three different types of flour sold at a grocery store. Fill in the table. *Round your answers to the nearest hundredth of a dollar.*

Type of Flour	Amount Paid	Amount Purchased	Cost per Pound
Cake	$\$21.60$	$10\ lb$	
Pastry	$\$8.60$	$2\ lb$	
Self-raising		$4\ lb$	$\$5.20$

a. Which type of flour costs the most per pound?

b. What is the price difference per pound between the most expensive flour and the cheapest flour?

77) A bookstore rents comic books. The line graph shows the cost of rental for comic books by the book store.



a. What is the total rental cost for 5 comic books?

b. William borrowed 12 comic books. How much does he pay for the rental in total?

Section 5.3: Distance and Speed

Solve.

78) A car travels at a speed of $55\ miles\ per\ hour$. How far will it travel in 5 hours?

79) An airplane traveled $5,138\ kilometers$ from Country A to Country B in $7\ hours$, and traveled $6,013\ kilometers$ from Country B to Country C in the same amount of time.

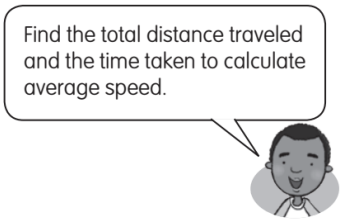
a. What was the speed of the airplane when it traveled from Country A to Country B?

b. What was the speed of the airplane when it traveled from Country B to Country C?

Section 5.4: Average Speed

Solve.

80) Julian walked from his house for 2 hours at a speed of $4\ miles\ per\ hour$ to the library. He then returned home by bicycle at a speed of $12\ miles\ per\ hour$. Find his average speed for the whole journey in $miles\ per\ hour$.



81) Brooke cycled at an average speed of $22\ kilometers\ per\ hour$ from her house to the nearby park and cycled back at an average speed of $14\ kilometers\ per\ hour$ via the same route. She took 66 minutes to cycle back to her house. How long, in minutes, did she take to cycle from her house to the nearby park?

Percent

Section 6.1: Understanding Percent

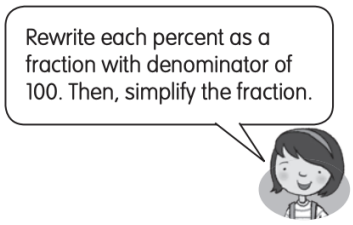
Solve.

82) Out of 40 questions, Jordan answered 18 of them incorrectly. What percent of the questions did he answer correctly?

Express each percent as a fraction or a mixed number in simplest form.

83) 86%

84) 675%



Express each percent as a decimal.

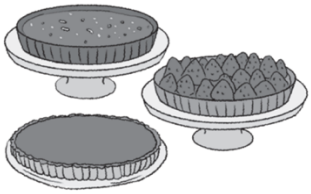
85) 7%

86) 367%

87) 475%

Solve.

88) In a bakery, 14 chocolate tarts, 24 strawberry tarts, and 10 cheese tarts are made. What percent of the tarts are chocolate?



Section 6.2: Fractions, Decimals and Percent

Express each fraction or mixed number as a percent.

89) $\frac{13}{25}$

90) $5\frac{3}{10}$

91) $8\frac{17}{20}$

Express each decimal as a percent.

92) 0.78

93) 6.25

94) 32.5

Express each percent as a fraction in simplest form.

95) 0.8%

96) 45.5%

97) $57\frac{2}{5}\%$

Solve.

98) A group of children were surveyed and asked to name their favorite color. The table shows the results of the survey.

Red	Orange	Green	Blue	Yellow
16	20	40	14	30

a. What percent of the students preferred green?

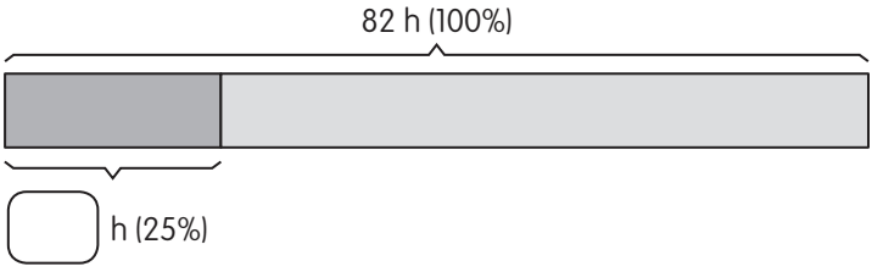
b. What percent of the students preferred the least favorite color?

c. What percent of the students preferred yellow or orange?

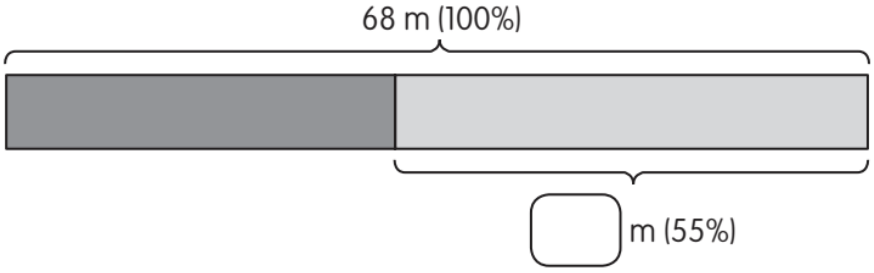
Section 6.3: Percent of a Quantity

Solve. Use the bar model to help you.

99) What is 25% of 82 hours?



100) Luis ran 68 meters and Mandy ran 55% of the distance Luis ran. How far did Mandy run?



Find the quantity represented by each percent.

101) 36% of 540 gallons

102) 110% of $\$610$

Solve.

103) 45% of a number is 180. Find the number.

104) A bean bag is filled with red and green beans. Of the total number of beans, 30% are red. There are 720 red beans. How many beans are there in the bag?

105) Ms. Stewart has $\$660$. She uses 30% of her money to buy a dress and 20% of the remainder to buy a pair of shoes. How much does she have left?



106) A box contains 160 pieces of fruit. 15% of the pieces of fruit are apples, 25% of the remaining are melons, and the rest are oranges. How many oranges are there in the box?

Section 6.4: Real-World Problems: Percent

Solve. Check that each answer is reasonable.

107) Ms. Cox and her three friends are dining at a restaurant. The food they order costs $80. The bill includes an additional 15% service charge. How much does each person pay if they share the bill equally?

Algebraic Expressions

Section 7.1: Using Letters to Represent Numbers

Write an algebraic expression for each statement.

108) Sum of h and 4

109) x more than 12

110) Quotient of p and 3

111) Subtract 8 from d

112) 6 less than b

113) 7 groups of c

114) Nellie has q stickers.

a. Jane has 9 fewer stickers than Nellie. How many stickers does Jane have in terms of q?

b. Jacob has 4 times as many stickers as Nellie. How many stickers does Jacob have in terms of q?

c. Fred has 23 more stickers than Nellie. How many stickers does Fred have in terms of q?

d. Karen has $\frac{3}{7}$ as many stickers as Nellie. How many stickers does Karen have in terms of q?

115) Add 15 to the product of y and 3.

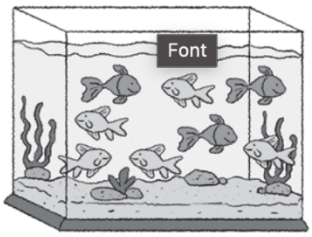
116) The price of a sling bag, given that it costs twice as much as a box of cards that costs m dollars.

117) The total number of seashells Mandy and Ken have, given that Mandy has $4s$ seashells and Ken has 12 more seashells that Mandy.

Solve.

118) In a bakery, a bag of croissants costs y dollars. A loaf of multi-grain bread costs $\$3$ more than a bag of croissants. Mr. Potter pays $\$45$ for some loaves of multi-grain bread. Write the number of loaves of bread he buys in terms of y.

119) Ben has some goldfish in a fish tank. The ratio of orange goldfish to yellow goldfish is $3:5$. He has $6f$ orange goldfish. Write the number of yellow goldfish he has in terms of f.



Section 7.2: Evaluating Algebraic Expressions

Evaluate each expression for the given value of the variable.

120) $9b - 8$ when $b = 3$

121) $20 + \frac{7}{8}e$ when $e = 16$

Solve.

122) There are x colored pencils in a box. Write an expression in terms of x for each statement and evaluate the expression when $x = 24$.

a. The number of colored pencils in 3 boxes.

b. The number of colored pencils each child gets when a box of colored pencils and 6 colored pencils are shared equally among 5 children.

Evaluate each expression when $r = 8$.

123) $6(4r + 3) - 2(5r - 8)$

124) $\frac{5r+6}{6} + \frac{3r-2}{4} + \frac{3r}{2}$

Evaluate each of the following when $k = 5$.

125) Subtract 40 from the sum of $8k$ and 12.

126) Product of $(3k + 1)$ and $(3k - 5)$

127) Sum of $\frac{5(k+3)}{6}$ and $\frac{2(k-1)}{3}$

128) Divide $4(k - 1)$ by $(k + 5)$

Section 7.3: Simplifying Algebraic Expressions

Simplify each expression.

129) $15f + 4f - 5f - 2f$

130) $21s - 19 + 2s - 24s + 15 - 7s$

State whether each pair of expressions is equivalent.

131) $7h$ and $7 + h$

132) $4k + 3k$ and $\frac{18k}{6} + 2k$

Solve.

133) Lucas had $20b\ liters$ of milk. He drank $3b\ liters$ of milk every day. How much milk was left after 4 days?

134) The cost of a doll is $7x\ dollars$ and the cost of a key chain is $x\ dollars$. Find the total cost of the 3 dolls and 4 key chains in terms of x.



135) Mrs. Lee works $4y\ hours$ each day from Monday to Friday. She works $(4y - 4)\ hours$ on Saturday. Find the number of hours Mrs. Lee works in one week in terms of y.

Section 7.4: Expanding and Factoring Algebraic Expressions

Factor each expression.

136) $9 - 18f$

137) $30h + 15$

State whether each pair of expressions is equivalent.

138) $10(3 + 4k)$ and $40k + 30$

139) $3(n + 3)$ and $9n + 9$

Expand and simplify each expression.

140) $8(4p - 3) + 5(7 + 10p)$

141) $3(8s - 5) + 4s - 2$

Simplify each expression. Then, factor the expression.

142) $3(4 + 5u) + 6(3u + 8)$

143) $4v - 12 + 9(3 - v)$

Solve.

144) A train is moving at an average speed of $(4a + 7)\ miles\ per\ hour$. Write an expression in terms of a for the distance traveled by the train in $4\ hours$.

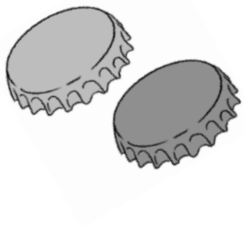


145) The average height of 5 children is $(9c + 4)\ centimeters$. Two more children with heights of $(10c + 7)\ centimeters$ and $(14c - 3)\ centimeters$ join the group. Find the average height of the 7 children in terms of c.

Section 7.5: Real-World Problems: Algebraic Expressions

Solve.

146) Amanda, Bruno and Carla collected bottle caps for charity. Amanda collected $(4f - 3)$ bottle caps. Bruno collects twice as many bottle caps as Amanda. Carla collects $3(5 + 2f)$ bottles. How many bottles did they collect altogether in terms of f?



147) Alex's house is located c *miles* from his school. The shopping mall is 4 *miles* farther from his house to his school. The library is 2 *miles* less than twice the distance from his school to his house.

a. Write an expression that shows the distance from Alex's house to the shopping mall.

b. Write an expression that shows the distance from Alex's house to the library.

c. If $c = 4$, is the shopping mall or the library closer to his house? How much closer?

Equations & Inequalities

Section 8.1: Solving Algebraic Equations

Solve each equation using the concept of balancing.

148) $3h = 12$

149) $\frac{j}{3} = 9$

Solve each equation using the concept of balancing. Express each answer in its simplest form.

150) $\frac{5}{6} + l = \frac{7}{6}$

152) $2p = \frac{1}{3}$

151) $\frac{3}{4}n = 6$

153) $34.9 - v = 20.1$

Section 8.2: Writing Linear Equations

Solve.



154) Alan has x sunflowers, Bella has 3 times as many sunflowers as Alan.

a. If y stands for the number of sunflowers Bella has, express y in terms of x.

b. State the independent and dependent variables in the equation.

155) Mrs. Kim buys $2x\ pounds$ of ham. Mrs. Lee buys $2.5\ pounds$ less than Mrs. Kim.

a. If the amount Mrs. Lee buys is $y\ pounds$ of ham, express y in terms of x.

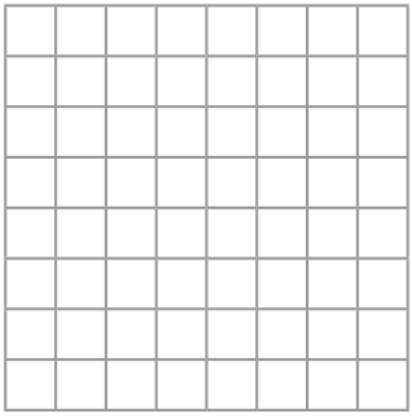
b. State the independent and dependent variables in the equation.

156) Claire walked $1.5\ miles$ at a constant speed for $30\ minutes$. She walked $y\ miles$ after $x\ minutes$.

a. Express y in terms of x.

b. Make a table to show the relationship between y and x. Use values of $x = 10, 20, 30, 40,$ and 50 in your table.

c. Graph the relationship between y and x on a coordinate plane.



d. Use your graph to find the distance she walked after $45\ minutes$.

Section 8.3: Real-World Problems: Equations

Write an algebraic equation for each problem. Then, solve.

157) The length of a rectangle is $2\ inches$ longer than its width. The perimeter is $40\ inches$. Find its width.



158) When a number is halved, the result is 29. What is the number?

159) The height of a growing plant seedling is $6\ centimeters$. It grows to a new height of $9.6\ centimeters$ the next day. Find the percent of increase in height.





GREAT WORK!!!!
YOU HAVE OFFICIALLY COMPLETED YOUR 2025 MATH SUMMER PACKET!