

Missouri MAP Grade 7 Math Practice

Exam Materials
Pages 2 - 25

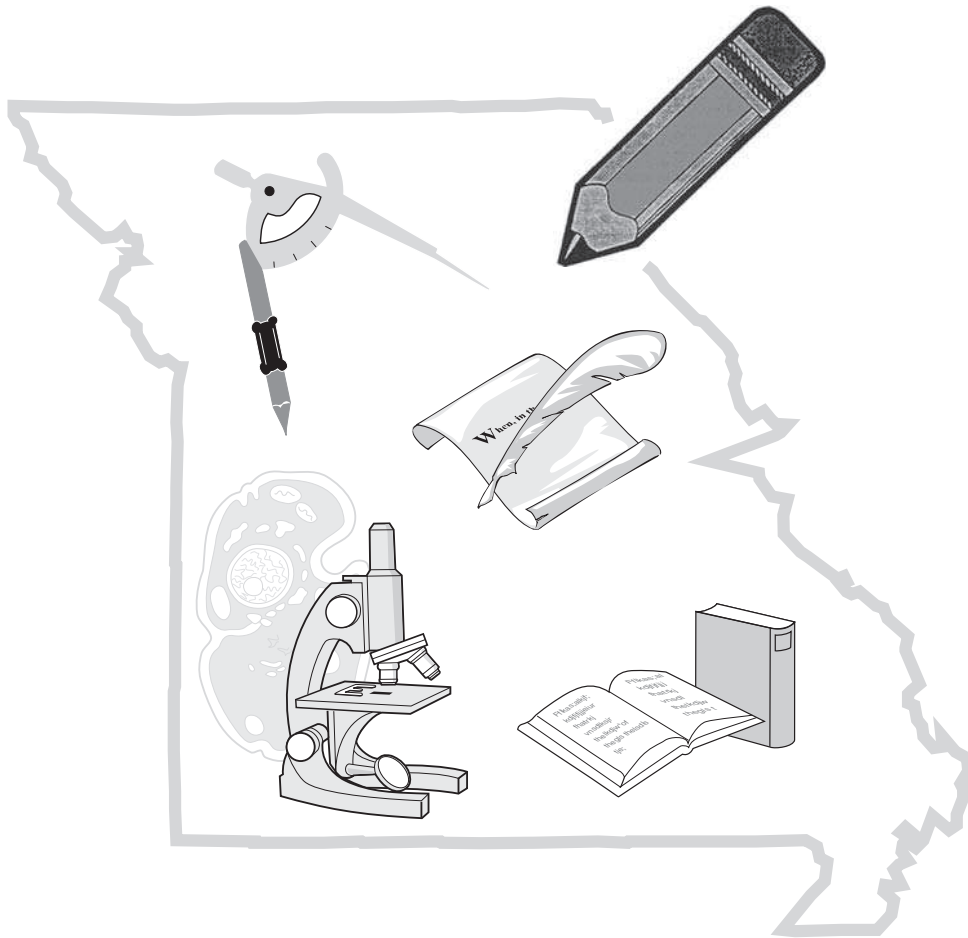
Answer Key Materials
Pages 26 - 28

Name: _____

District/School: _____

Missouri Assessment Program

Released Practice Form Grade 7 Mathematics



1. Select the **three** rational numbers.

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

B. $\frac{7}{0}$

C. -0.02

D. $4.1\overline{7}$

E. π

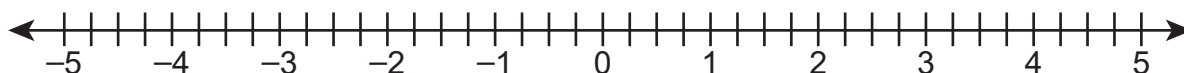
F. π^2

2. Lamar has a container filled with nickels that have a value of \$51.45. He has 4 other identical containers with nickels. Of the 4 other identical containers,
- 2 of them are full,
 - 1 of them is $\frac{3}{4}$ full, and
 - 1 of them is $\frac{1}{2}$ full.

Lamar estimates that the total value of all 5 containers of nickels is approximately \$250. Which statement **best** explains why Lamar's estimate is likely an overestimate or an underestimate?

- A. Lamar's estimate is likely an underestimate because $5 \times \$51 = \255 .
- B. Lamar's estimate is likely an underestimate because it is likely that at least one of the other 2 full containers contains more than \$51.45.
- C. Lamar's estimate is likely an overestimate because he has just over 4 full containers, and $4 \times \$50 = \200 .
- D. Lamar's estimate is likely an overestimate because it is doubtful that the other full containers are worth exactly \$51.45.

3. A recipe calls for $2\frac{1}{3}$ cups of flour. Jane needs to make only half of the recipe. Which expression could Jane use to calculate the number of cups of flour she needs?
- A. $2\frac{1}{3} + \frac{1}{2}$
- B. $2\frac{1}{3} - \frac{1}{2}$
- C. $2\frac{1}{3} \cdot \frac{1}{2}$
- D. $2\frac{1}{3} \div \frac{1}{2}$
4. Emanuel is planting trees along a new city sidewalk. He plants the same number of trees on each city block. After 3 blocks, he has planted 15 trees. After 5 blocks, he has planted 25 trees. At what rate is Emanuel planting trees?
- A. $\frac{1}{5}$ trees per block
- B. $\frac{3}{5}$ trees per block
- C. 3 trees per block
- D. 5 trees per block
5. Diego does a science experiment. In the experiment, he mixes two chemicals together and immediately measures the mixture's temperature. One hour later, he measures the mixture's temperature again. He records the two temperatures as m and n . The temperature of the mixture immediately after creating it, m , is 1.75°C . The value of $|m - n|$ is 2.25°C . Plot all the possible values for n , the temperature of the mixture one hour later.



6. An expression is shown.

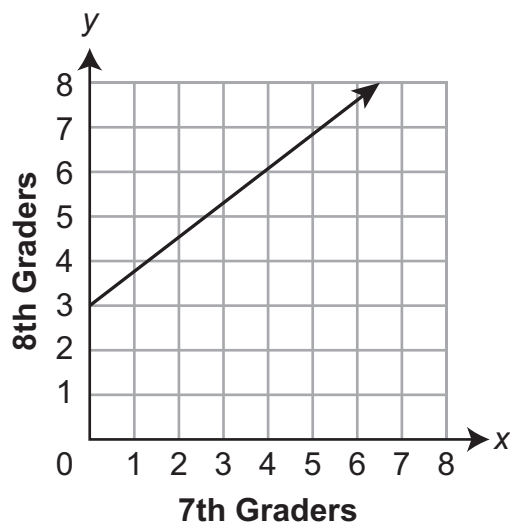
$$0.8(4x + 6y)$$

Select the **two** expressions that are equivalent to the given expression.

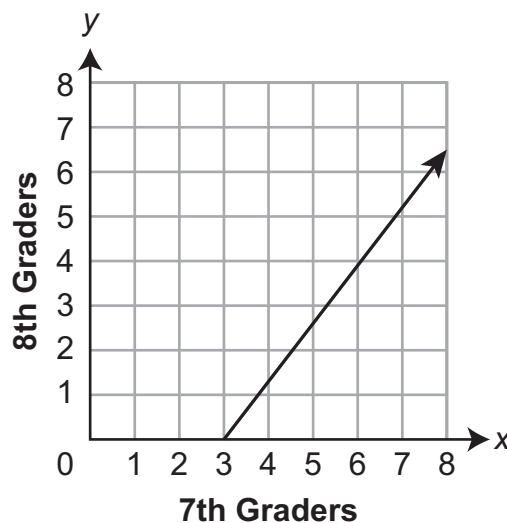
- A. $0.8(6x + 4y)$
 - B. $1.6(2x + 3y)$
 - C. $1.6x(2x + 4y)$
 - D. $3.2x + 4.8y$
 - E. $4.8x + 6.8y$
7. A cat receives 0.15 milliliter of medicine for every 2.5 pounds that it weighs. Tabby is a cat that weighs 9.75 pounds. How much medicine, rounded to the nearest hundredth of a milliliter, should Tabby receive?

8. On a softball team, the number of 7th graders is proportional to the number of 8th graders. Which graph could model the relationship between the number of 7th graders and 8th graders on the softball team?

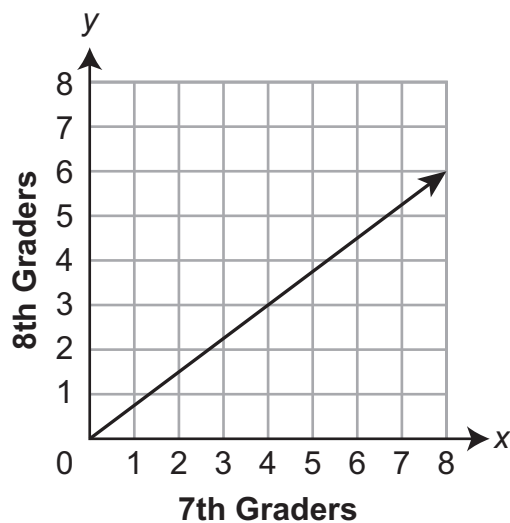
A.



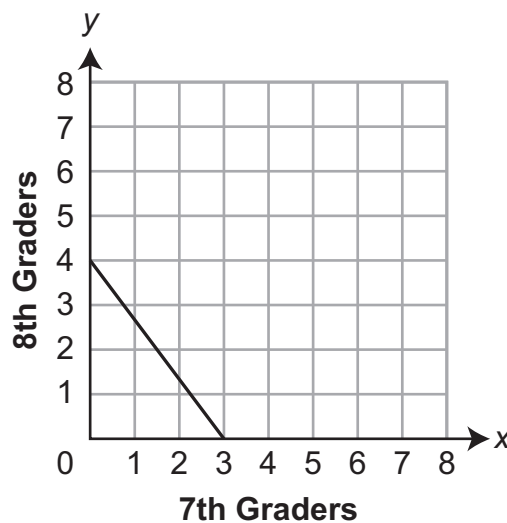
B.



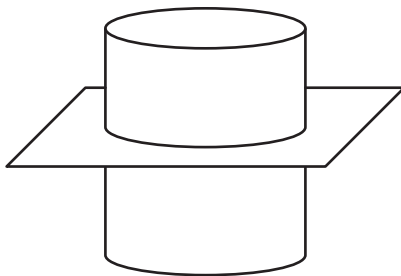
C.



D.

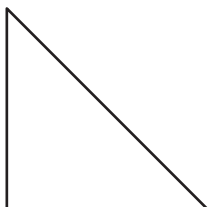


9. A cylinder is sliced parallel to its base, as shown.



Which figure represents the two-dimensional cross section?

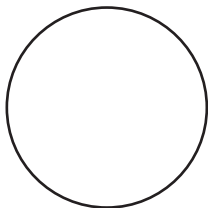
A.



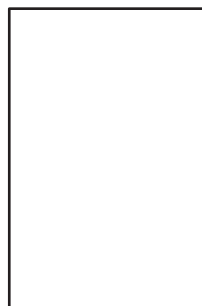
B.



C.



D.



10. Whenever Hannah turns on her cell phone, it randomly shows a background image from a group of 6 images Hannah has selected. Of the 6 images Hannah has selected,
- exactly 2 are of her friends,
 - exactly 3 are of her family members, and
 - exactly 1 is of her pet dog.

What is the probability that the cell phone shows an image other than the pet dog the next time Hannah turns on her cell phone?



11. What is $4 \div (-2.5)$?

12. Christopher has a website. He updates his website the same number of times each week.

- After 3 weeks, Christopher had updated his website a total of 12 times.
- After 5 weeks, Christopher had updated his website a total of 20 times.

Christopher makes a graph to show the relationship between the number of weeks that have passed, x , and the number of times he has updated his website, y . Use the numbers below the blank lines to show the coordinates of the point that represents the unit rate, in updates per week, of Christopher's graph.

(_____ , _____)

0 0

1 1

2 2

3 3

4 4

5 5

6 6

7 7

8 8

9 9

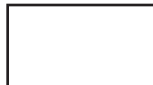
10 10

13. Chad is putting a frame around a picture. He needs to decide whether he wants the frame to be black or brown. He also needs to decide whether he wants the frame to be made of metal or of wood. Finally, he needs to decide whether he wants the picture covered with glass or with plastic. He makes a list of his options as shown.

{black, metal, glass}
{black, metal, plastic}
{black, wood, glass}
{black, wood, plastic}
{brown, metal, plastic}
{brown, wood, glass}
{brown, wood, plastic}

Which option did Chad forget to include in his list?

- A. {brown, metal}
B. {brown, wood, plastic}
C. {brown, metal, black}
D. {brown, metal, glass}
14. A sprinkler waters a circular region in Jason's yard that has a radius of 15 feet. Rounded to the nearest square foot, what is the area of the circular region that is watered by the sprinkler?
- A. 94
B. 148
C. 707
D. 2,827
15. What is the solution to the equation $2(x + 2.4) = 6.4$?
- A. 0.8
B. 2
C. 4
D. 10.4
16. A store is offering a 30% discount on shirts. A shirt at the store has an original cost of \$25. What is the cost of the shirt, in dollars, after the discount?



17. In a mine, 0.6% of all the mined material is copper. The company that runs the mine needs the mine to produce more than 0.81 million tons of copper to make a profit this year. The mine has already produced 0.75 million tons of copper this year. The inequality below represents x , the additional millions of tons of material that need to be mined this year for the mine to make a profit.

$$0.75 + 0.006x > 0.81$$

Which inequality shows all the possible values of x ?

- A. $x > 1$
B. $x > 10$
C. $x > 26$
D. $x > 260$
18. There are 50 tickets in a jar. Each ticket is either red or blue. Jeanette randomly draws 10 tickets from the jar, counts the number of red tickets, and then replaces the tickets. She does this 8 times. The list shows how many red tickets Jeanette drew on each attempt.

3 4 6 7 3 4 2 3

What is the **best** estimate for the total number of red tickets in the jar?

- A. 4
B. 20
C. 25
D. 32
19. Jamar is buying bottles of juice for his class party. A pack of 12 bottles of juice costs \$3.96. Which expression could Jamar use to determine the cost of 1 bottle of juice?
- A. $3.96 \div 12$
B. $3.96 \cdot 12$
C. $12 \div 3.96$
D. $12 - 3.96$

20. Carter writes the expression $0.25x + 1.75y + 0.25y + 1.5xy$. He wants to rewrite the expression by combining like terms. For each pair of terms in the table, mark whether they are like terms or not like terms.

	Like Terms	Not Like Terms
0.25x and 1.75y		
0.25x and 0.25y		
0.25x and 1.5xy		
1.75y and 0.25y		
1.75y and 1.5xy		
0.25y and 1.5xy		

21. Nina works at a company that makes cylindrical cans. She finds the area of the base of one of the cans and then multiplies that area by the height of the can. What is Nina most likely calculating?
- A. length
B. radius
C. surface area
D. volume
22. A club is selling cookies to earn money. The club is going to donate $\frac{1}{4}$ of the money to charity and keep the rest. The total cookie sales are \$367.20. Which expression could be used to determine the amount of money the club will keep?
- A. $367.20 - 0.14(367.20)$
B. $367.20 - 0.25(367.20)$
C. $367.20 - 0.4(367.20)$
D. $367.20 - 2.5(367.20)$

23. Arie has a bag that contains 15 yellow marbles, 13 blue marbles, and 22 red marbles. Select the **two** statements that are true when Arie randomly draws 10 marbles from the bag.
- A. She is likely to draw all red marbles.
 - B. She is likely to draw more blue marbles than red marbles.
 - C. She is likely to draw more red marbles than yellow marbles.
 - D. She is likely to draw about the same number of yellow and blue marbles.
 - E. She is likely to draw more red marbles than yellow and blue marbles combined.

1. Li put \$75 into his savings account. The money was $\frac{1}{3}$ of his paycheck. Which equation could be used to find the amount of money, p , in dollars, on his paycheck?

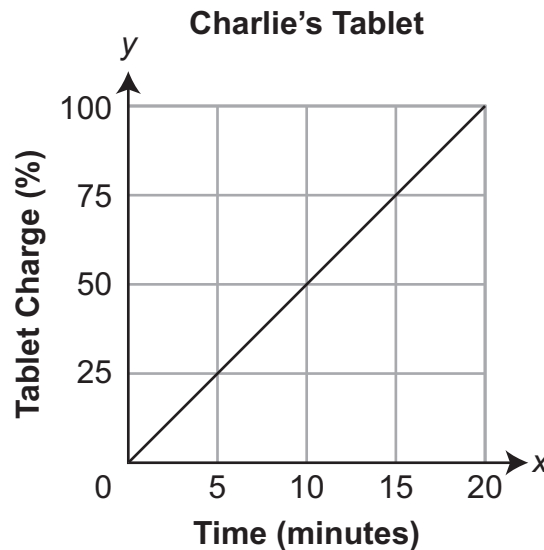
A. $75p = \frac{1}{3}$

B. $3p = 75$

C. $75p = 3$

D. $\frac{1}{3}p = 75$

2. Charlie is charging his tablet. The graph shows how long it takes for his tablet to charge.



Which statement about the ordered pair (5, 25) is true?

- A. It takes 5 minutes to charge 25 tablets.
- B. It takes 25 minutes to charge 5 tablets.
- C. It takes 5 minutes to charge 1 tablet to 25%.
- D. It takes 25 minutes to charge 1 tablet to 5%.

3. An inequality is shown.

$$-2x + 12 < 18$$

What is the solution to the inequality?

- A. $x < -3$
 - B. $x > -3$
 - C. $x < 3$
 - D. $x > 3$
4. An expression is shown.

$$-3(x - 4)$$

Which expression is equivalent to the given expression?

- A. $-3x + 4$
 - B. $-3x - 4$
 - C. $-3x + 12$
 - D. $-3x - 12$
5. Linda ate $\frac{1}{8}$ of a batch of cornbread. Peter ate some cornbread so that there is $\frac{2}{3}$ of the batch remaining. What fraction of the batch of cornbread did Peter eat?

- A. $\frac{3}{11}$
- B. $\frac{5}{24}$
- C. $\frac{8}{11}$
- D. $\frac{19}{24}$

6. A proportional relationship is shown.

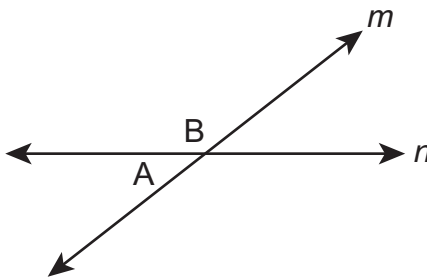
x	y
0	0
2	0.9
4	1.8
6	2.7
8	3.6

What is the constant of proportionality?

7. Jorge wants to buy his father a gift that costs \$32. He has already saved \$18 for the gift. Jorge saves the same amount of money each week for the next 4 weeks. How much money, in dollars, will Jorge have to save each week to have exactly enough money to buy his father the gift?

8. Lily tosses a fair coin in the air 20 times and records the results. The coin lands with the tails side up in 12 of the 20 trials. Which statement about Lily's trials is correct?
- A. The theoretical probability is 50%, because at least 50% of Lily's coin tosses landed with the tails side up.
- B. The theoretical probability of landing with the tails side up is $\frac{12}{20} = 60\%$, because that is what Lily observed.
- C. The experimental probability is 50%, because at least 50% of Lily's coin tosses landed with the tails side up.
- D. The experimental probability of landing with the tails side up is $\frac{12}{20} = 60\%$, because that is what Lily observed.

9. Lines m and n are shown.



Angle A measures 38° . What is the measure, in degrees, of angle B?

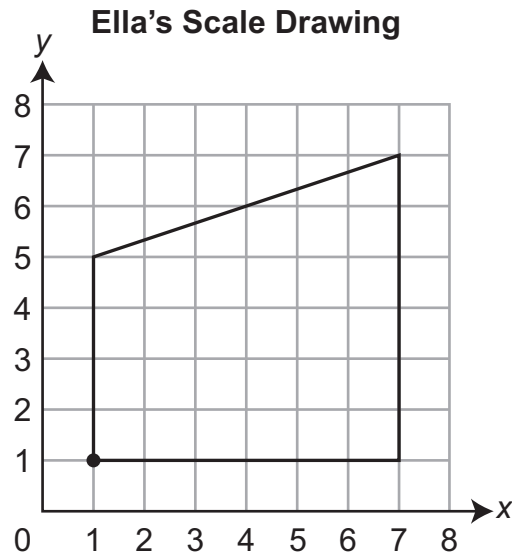
10. Louis went to a movie with \$20.00. The ticket cost \$9.50, and he spent \$2.75 on snacks. How much money did Louis have left over?
- A. \$7.75
B. \$8.75
C. \$11.25
D. \$12.25
11. Julia uses a scale to weigh three identical stacks of coins.
- The scale has a maximum percent error of 3%.
 - The scale says the weight of the first stack of coins is 10.0 ounces.
 - The scale says the weight of the second stack of coins is 10.3 ounces.

Rounded to the nearest tenth of an ounce, what is the greatest possible amount that the scale could say for the weight of the third stack of coins?

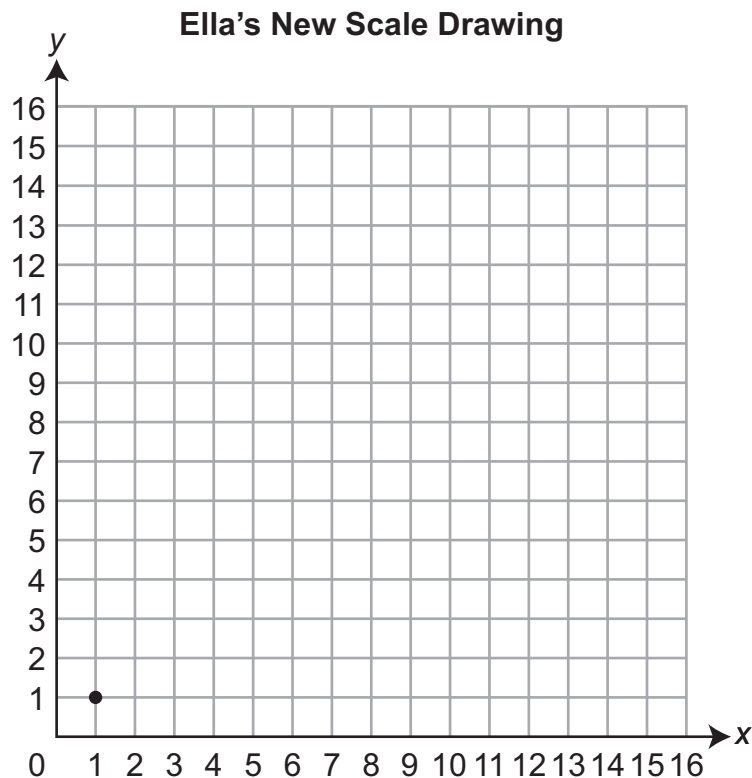
- A. 9.7 ounces
B. 10.0 ounces
C. 10.3 ounces
D. 10.6 ounces

12. Class X and class Y each have 20 students. They each keep track of the number of books each student reads in one month. The mean number of books read by the students in class X is 4.2 books. The mean number of books read by the students in class Y is 3.8 books. Select the **two** statements that are true.
- A. Every student in class X read more books than any student in class Y.
 - B. The students in class X like reading more than the students in class Y.
 - C. The students in class X read longer books than the students in class Y.
 - D. On average, the students in class X read more books than the students in class Y.
 - E. The total number of books read by class X is more than the total number of books read by class Y.

13. Ella designs a glass tabletop for a restaurant. She makes the scale drawing shown.



In Ella's scale drawing, the length of each square on the grid represents 12 inches. Make a new scale drawing of Ella's tabletop in which the length of each square on the grid represents 6 inches. The plotted point in Ella's new scale drawing should correspond to the plotted point in Ella's original scale drawing.

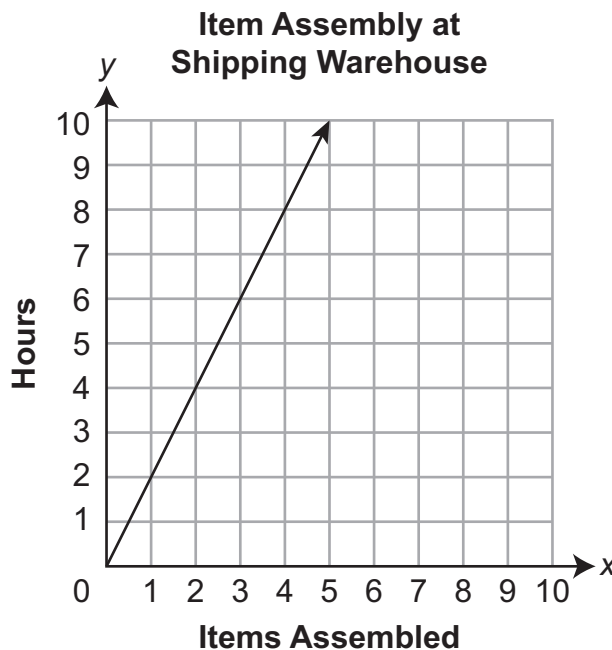


14. Chelsea buys a bag of apples. In the bag, $\frac{8}{11}$ of the apples are green. Which number could also represent the portion of the apples in the bag that are green?
- A. 0.72
- B. $0.\overline{72}$
- C. $0.\overline{7\overline{2}}$
- D. 1.375
15. A triangle has sides that are 4 units, 6 units, and m units long. Select the **two** numbers that are possible values of m .
- A. 1
- B. 2
- C. 5
- D. 8
- E. 12
16. Sophia earned \$18 for working $2\frac{1}{4}$ hours. How much did she earn per hour?
- A. \$8.00
- B. \$9.00
- C. \$9.25
- D. \$12.50

17. A library keeps track of the number of overdue items at the end of each month.
- At the end of April, there were x overdue items.
 - At the end of May, the number of overdue items was 3% less than the number of overdue items at the end of April.

The expression $x - 0.03x$ represents the number of overdue items at the end of May. Which sentence **best** explains how to simplify the expression that represents the number of overdue items at the end of May?

- A. Combine x and $0.03x$, since they are like terms, by canceling out the x .
- B. Combine x and $0.03x$, since they are like terms, by subtracting $1 - 0.03$ to find the new coefficient.
- C. Factor out an x , since it appears in both terms, leaving 1 in the first term and $0.03x$ in the second term.
- D. Factor out an x , since it appears in both terms, eliminating the first term and leaving 0.03 in the second term.
18. The graph shows the number of hours it takes to assemble several items at a shipping warehouse.

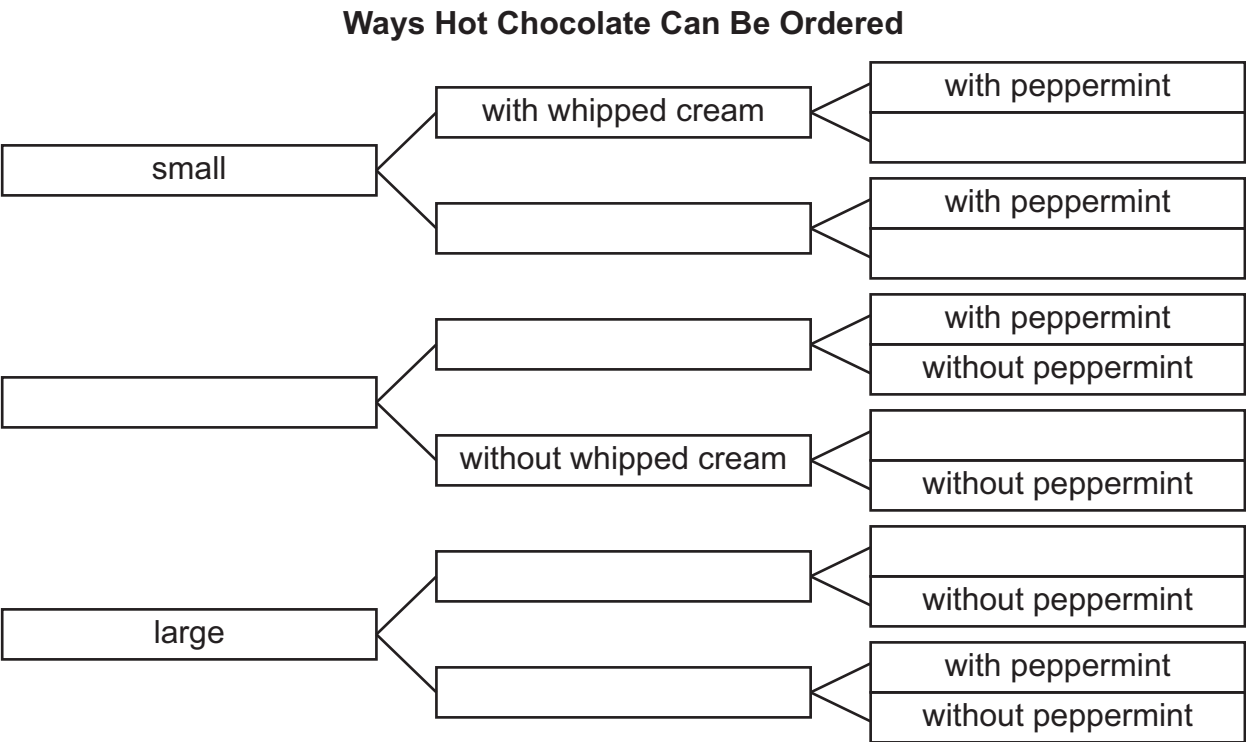


What does the point (3, 6) represent?

- A. It takes 3 hours to assemble 1 item at the shipping warehouse.
- B. It takes 3 hours to assemble 6 items at the shipping warehouse.
- C. It takes 6 hours to assemble 1 item at the shipping warehouse.
- D. It takes 6 hours to assemble 3 items at the shipping warehouse.

19. Jared sells hot chocolate at football games.
- He sells small, medium, and large hot chocolates.
 - Each hot chocolate can be ordered with or without whipped cream.
 - Each hot chocolate can be ordered with or without peppermint.

Complete the tree diagram to show all the possible ways hot chocolate can be ordered. The options from which to select are shown below the tree diagram.



- 1 small
- 2 without whipped cream
- 3 with peppermint
- 4 large
- 5 with whipped cream
- 6 without peppermint
- 7 medium

20. Hector has $\frac{3}{4}$ hour to spend completing his homework. He wants to spend $\frac{1}{3}$ of his time on math homework, 10 minutes of his time on reading homework, and the remaining time on science homework. How much time, in **minutes**, does Hector have to spend on his science homework?



21. Gary has a box of pencils. In the box, $\frac{7}{21}$ of the pencils have been sharpened. Select the **three** fractions that are proportional to the fraction of sharpened pencils in Gary's box.

- A. $\frac{1}{3}$
- B. $\frac{1}{7}$
- C. $\frac{12}{4}$
- D. $\frac{13}{39}$
- E. $\frac{14}{42}$
- F. $\frac{21}{7}$

22. Ricardo has a coupon for 25% off his purchase at a craft store. Which expression could Ricardo use to calculate his **total cost** when purchasing x dollars of craft supplies?
- A. $0.25x$
 - B. $0.75x$
 - C. $1.00x$
 - D. $1.25x$

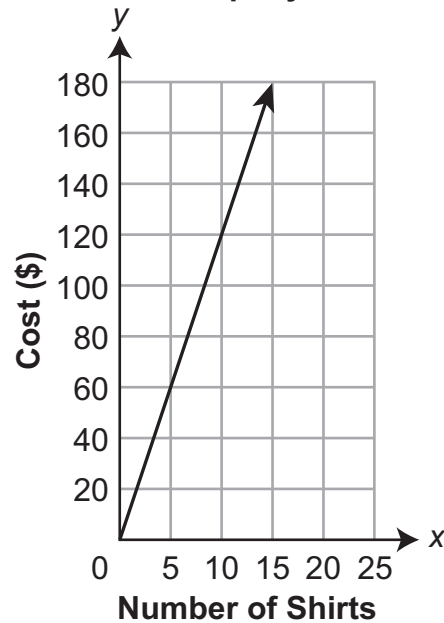
23. Which situation applies an additive inverse to find the total amount of money?

- A. Dylan spent \$5 and then found \$5.
- B. Dylan found \$5 and then found \$5 more.
- C. Dylan spent \$5 and then gave \$3 to a friend.
- D. Dylan found \$5 and then kept the money in his pocket.

1. Emma is buying a shirt for each member of her school's spirit club. There are 300 students in her school, and 20% of the students are members of the spirit club. Emma can buy the shirts from either Company A or Company B. The costs for buying different numbers of shirts are shown in the table for Company A and in the graph for Company B.

Company A

Number of Shirts	Cost (\$)
10	145.00
25	362.50
50	725.00
100	1,450.00

Company B

Which company gives Emma the better deal? Show or explain your reasoning. Be sure to include the total cost, in dollars, for buying the shirts from each company.

2. Reagan and Jordan want to purchase a new bed for their dog. All beds at Paul's Pets are 50% off. While they are shopping, the store announces a special sale for an additional 20% off the discounted price for all items. The bed Reagan and Jordan want to purchase costs \$45 before any discounts are applied. Reagan claims that pet beds are now 70% off. Jordan disagrees and claims that the total discount is not 70%. Who is correct? Provide mathematical evidence for your reasoning. Be sure to include the final cost of the bed for Reagan's claim and for Jordan's claim.

Math – Grade 7

Scoring Guide and Rubric

Session 1

All items worth 1 point

Item	Type	MLS	Answer
1	Multi-Select Response	7.NS.A.2.e	A, C, D
2	Multiple Choice	7.EE1.B.3.b	C
3	Multiple Choice	7.NS.A.2.f	C
4	Multiple Choice	7.RP.A.2.b	D
5	Technology Enhanced (Online) Constructed Response (Paper)	7.NS.A.1.e	Plot points at: $-1/2$ and 4
6	Multi-Select Response	7.EE1.A.1	B and D
7	Short Answer	7.NS.A.3	.59
8	Multiple Choice	7.RP.A.2.d	C
9	Multiple Choice	7.GM.A.3	C
10	Short Answer	7.DSP.C.5.a	$5/6$
11	Short Answer	7.NS.A.2.a	-1.6
12	Technology Enhanced (Online) Multi-Select Response (Paper)	7.RP.A.2.c	(1,4)
13	Multiple Choice	7.DSP.C.8.a	D
14	Multiple Choice	7.GM.A.4.b	C
15	Multiple Choice	7.EE1.B.4.b	A
16	Short Answer	7.RP.A.3	17.50
17	Multiple Choice	7.EE1.B.4.c	B
18	Multiple Choice	7.DSP.A.2	B
19	Multiple Choice	7.RP.A.1	A
20	Technology Enhanced (Online) Constructed Response (Paper)	7.EE1.A.2	Like Terms: $1.75y$ and $0.25y$ Not Like Terms: All other choices (All correct to receive credit)
21	Multiple Choice	7.GM.B.6.b	D
22	Multiple Choice	7.EE1.B.3.a	B
23	Multi-Select Response	7.DSP.A.1.c	C and D

Math – Grade 7

Scoring Guide and Rubric

Session 2

All items worth 1 point

Item	Type	MLS	Answer
1	Multiple Choice	7.EE1.B.4.a	D
2	Multiple Choice	7.RP.A.2.c	C
3	Multiple Choice	7.EE1.B.4.c	B
4	Multiple Choice	7.EE1.B.4.c	C
5	Multiple Choice	7.NS.A.1.f	B
6	Short Answer	7.RP.A.2.b	0.45
7	Short Answer	7.EE1.B.4.b	3.50
8	Multiple Choice	7.DSP.C.6.c	D
9	Short Answer	7.GM.B.5	142
10	Multiple Choice	7.NS.A.1.a	A
11	Multiple Choice	7.RP.A.3	D
12	Multi-Select Response	7.DSP.B.3	D and E
13	Technology Enhanced (Online) Constructed Response (Paper)	7.GM.A.1	Plot points at: (1,1), (1,9), (13,1), (13,13) and connect points with line segments
14	Multiple Choice	7.NS.A.2.d	C
15	Multi-Select Response	7.GM.A.2.a	C and D
16	Multiple Choice	7.RP.A.1	A
17	Multiple Choice	7.EE1.A.2	B
18	Multiple Choice	7.RP.A.2.c	D
19	Technology Enhanced (Online) Constructed Response (Paper)	7.DSP.C.8.a	Left column: 7, Middle column: 2, 5, 5, 2 or 2, 5, 2, 5 Right column: 6, 6, 3, 3
20	Short Answer	7.EE1.B.3.a	20
21	Multi-Select Response	7.RP.A.2.a	A, D, E
22	Multiple Choice	7.EE1.A.2	B
23	Multiple Choice	7.NS.A.1.c	A

Math – Grade 7

Scoring Guide and Rubric

Session 3

Item	Type	MLS	Answer
1	Performance Event	7.RP.A	<p>Exemplary Response</p> <p>First, Emma would figure out how many t-shirts she needs by calculating 20% of $300=60$. Therefore, she needs 60 shirts. Then, she would find the unit rate for each company. Company A is $145/10=\\$14.50$ per shirt. Company B is $\\$60/5=\\12 per shirt. Now, Emma needs to figure the cost for 60 t-shirts for each company. Company A costs $\\$14.50 \times 60=\\870. Company B costs $\\$12 \times 60 = \\720. So company B gives Emma the better deal.</p>
			<p>Scoring</p> <p>4 points available</p> <p><u>3 points</u>: The student shows or explains their reasoning, including the total costs for company A (\$870) and company B (\$720).</p> <p><u>1 point</u>: The student determines which company gives Emma the better deal (company B). If this is the only point earned by the student, some minimal work or explanation is needed.</p> <p>Note: Comparing the unit rates for each company is sufficient to determine which company gives the better deal, but the total costs are still required.</p>
2	Performance Event	7.RP.A	<p>Exemplary Response</p> <p>Jordan is correct because 50% of $\\$45$ is $\\$22.50$, and 20% of $\\$22.50$ is $\\$18$ ($.8 \times 22.50$), which is the final cost of the bed after all discounts. This cost is not the same as Reagan's claim of 70% off $\\$45$, which is $.3 \times 45 = \\$13.50$.</p>
			<p>Scoring</p> <p>4 points available</p> <p><u>3 points</u>: The student provides mathematical evidence for their reasoning, including the final cost of the bed for Reagan's claim (\$13.50) and for Jordan's claim (\$18).</p> <p><u>1 point</u>: The student states that Jordan is correct, including at least some supporting evidence.</p>