Math
Spring Operational 2015

Grade 7
End of Year Released Items

M20843

1. A meteorologist was monitoring the temperature outside in degrees Fahrenheit (°F) and wrote the expression $78 + (-6) - 5$. Which statement best describes this expression?

   A. The temperature started at 78°F and increased by 6°F. Then the temperature decreased by 5°F.

   B. The temperature started at 78°F and increased by 6°F. Then the temperature increased by 5°F.

   C. The temperature started at 78°F and decreased by 6°F. Then the temperature decreased by 5°F.

   D. The temperature started at 78°F and decreased by 6°F. Then the temperature increased by 5°F.

M21827

2. Which expression is equivalent to $2.2 - 2.5$?

   A. $2.5 - 2.2$

   B. $2.2 + 2.5$

   C. $2.2 + (-2.5)$

   D. $2.2 - (-2.5)$

VF560633

3. Last week, the value of an investment changed at a rate of $-\$3.15$ each day. After how many days was the total change in value $-\$12.60$?

   Enter your answer in the box.

VF888892

4. Indicate whether each expression in the table is equivalent to $\frac{1}{2}x - 1$, equivalent to $x - \frac{1}{2}$, or **not** equivalent to $\frac{1}{2}x - 1$ or $x - \frac{1}{2}$.

Select all appropriate cells in the table.

Expression	Equivalent to $\frac{1}{2}x - 1$	Equivalent to $x - \frac{1}{2}$	Not Equivalent to $\frac{1}{2}x - 1$ **or** $x - \frac{1}{2}$
$\frac{2}{3}\left(\frac{3}{4}x - \frac{3}{2}\right)$	☐	☐	☐
$\left(2x + 1\right) - \left(x + \frac{3}{2}\right)$	☐	☐	☐

VF541775

5. Jordan's dog weighs p pounds. Emmett's dog weighs 25% more than Jordan's dog.

Which expressions represent the weight, in pounds, of Emmett's dog?

Select **each** correct answer.

- ☐ A. $0.25p$
- ☐ B. $1.25p$
- ☐ C. $p + 0.25$
- ☐ D. $p + 1.25$
- ☐ E. $p + 0.25p$

VF904681

6. Ed is a farmer who charges $3.75 for 5 pounds of cabbage. This table shows the rates charged for cabbage by some other farmers.

Determine whether the unit rate charged for cabbage by the other farmers is less than, equal to, or greater than the unit rate charged by Ed.

Select one cell per row.

Farmer	Rate	Unit Rate Less than Ed's Unit Rate	Unit Rate Equal to Ed's Unit Rate	Unit Rate Greater than Ed's Unit Rate
A	\$0.50 for $\frac{1}{2}$ pound	☐	☐	☐
B	\$0.75 for 1 pound	☐	☐	☐
C	\$1.75 for $2\frac{1}{2}$ pounds	☐	☐	☐
D	\$6.00 for 8 pounds	☐	☐	☐

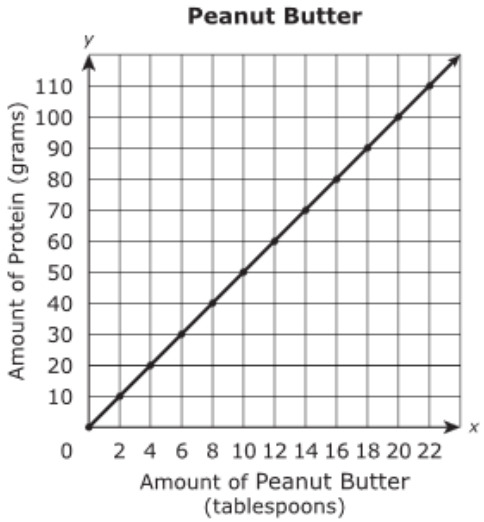
VF525256

7. The amount Troy charges to mow a lawn is proportional to the time it takes him to mow the lawn. Troy charges $30 to mow a lawn that took him 1.5 hours to mow.

Which equation models the amount in dollars, d, Troy charges when it takes him h hours to mow a lawn?

- A. $d = 20h$
- B. $h = 20d$
- C. $d = 45h$
- D. $h = 45d$

8. The graph shows the amount of protein contained in a certain brand of peanut butter.

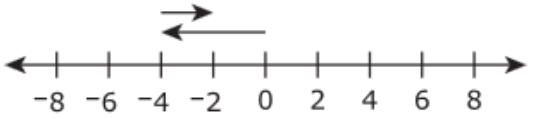
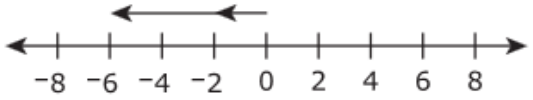


Which statement describes the meaning of the point $(6, 30)$ on the graph?

- A. There are 6 grams of protein per tablespoon of peanut butter.
- B. There are 30 grams of protein per tablespoon of peanut butter.
- C. There are 6 grams of protein in 30 tablespoons of peanut butter.
- D. There are 30 grams of protein in 6 tablespoons of peanut butter.

9. For each expression in the table, select which number line model, if any, can be used to represent the expression.

Select all appropriate cells in the table.

Expression			Neither number line model can be used to represent the expression.
$-2+4$	☐	☐	☐
$-2-4$	☐	☐	☐
$-2-(-4)$	☐	☐	☐
$-4+2$	☐	☐	☐
$-4-(-2)$	☐	☐	☐

VF522528

10. Which situation can be represented by the equation $1\frac{1}{4} \times 6 = 7\frac{1}{2}$?

- A. It took Calvin $1\frac{1}{4}$ hours to run 6 miles. He ran $7\frac{1}{2}$ miles per hour.
- B. Sara read for $1\frac{1}{4}$ hours every day for 6 days. She read for a total of $7\frac{1}{2}$ hours.
- C. Matthew addressed $1\frac{1}{4}$ envelopes in 6 minutes. He addressed $7\frac{1}{2}$ envelopes per minute.
- D. It took Beth $1\frac{1}{4}$ minutes to paint 6 feet of a board. She painted a total of $7\frac{1}{2}$ feet of the board.

VF556038

11. Determine whether each given expression **is** equivalent to $6 \times 4\frac{1}{2}$ or **is not** equivalent.

Select one cell per row.

Given Expression	**Is** Equivalent to $6 \times 4\frac{1}{2}$	**Is Not** Equivalent to $6 \times 4\frac{1}{2}$
$6 \times 4 + \frac{1}{2}$	☐	☐
$6 \times 5 - \frac{1}{2}$	☐	☐
$6 \times 4 + 6 \times \frac{1}{2}$	☐	☐
$6 \times 5 - 6 \times \frac{1}{2}$	☐	☐

VF654285

12. On Monday, the temperature at 10 a.m. at Sam's house was –6° Fahrenheit. The temperature at 2 p.m. at Sam's house was 2° Fahrenheit.

Select from the drop-down menus to correctly complete the statement.

From 10 a.m. to 2 p.m., the temperature at Sam's house [Choose...] by [Choose...] ° Fahrenheit.

Choose...
increased
decreased

Choose...
3
4
8
12

M21535

13. Determine which expression is equivalent to $\frac{3}{4} - x\left(\frac{1}{2} - \frac{5}{8}\right) + \left(-\frac{3}{8}x\right)$.

A. $-\frac{3}{4}x$

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

C. $\frac{1}{8} - \frac{7}{8}x$

D. $\frac{3}{4} - \frac{1}{4}x$

VF823888

14. Stefanie bought a package of pencils for $1.75 and some erasers that cost $0.25 each. She paid a total of $4.25 for these items, before tax.

Exactly how many erasers did Stefanie buy?

Enter your answer in the box.

M22528

15. Anita earns 60 points every time she shops at a grocery store. She needs a total of 2,580 points to receive a free prize. So far, she has earned 480 points. How many more times will Anita have to shop at the grocery store in order to earn the additional points she needs for a free prize?

A. 8

B. 35

C. 43

D. 51

VH01216

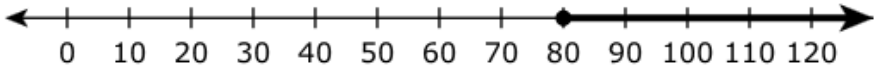
16. Ali is collecting signatures for a petition.

- He currently has 520 signatures.
- He has 6 more weeks to collect the remaining signatures he needs.
- He needs a total of at least 1,000 signatures before he can submit the petition.

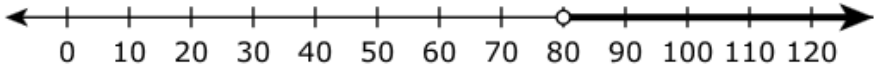
Ali wants to collect the same number of signatures each week.

Which number line represents all possible numbers of signatures Ali could collect in each of the remaining weeks so that he will have enough signatures to submit the petition?

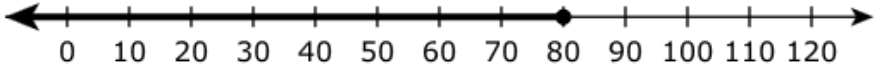
A.



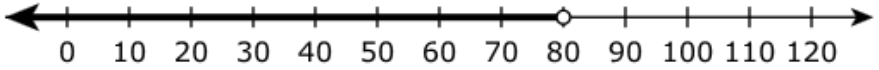
B.



C.



D.



VH000323

17. Jamal will slice a right circular cylinder into two congruent pieces. Which two-dimensional-plane sections **could result** from the slice Jamal makes?

Select **each** correct answer.

- [ ] A. circle
- [ ] B. pentagon
- [ ] C. hexagon
- [ ] D. triangle
- [ ] E. rectangle

M21112

18. A national dog show had two types of poodles. This table shows height data, in inches, for the two types of poodles.

Heights of Poodles

 Type of Poodle	Number of Dogs	Mean Height (inches)	Variation in Height (inches)
Miniature Poodle	18	13	2
Standard Poodle	24	23	2

What number completes the sentence?

Enter your answer in the box.

The difference, in inches, between the mean heights for the two types of poodles is

[ ] times the variation for either type.

M21895

19. Ruben put an empty cup underneath a leaking faucet. After $1\frac{1}{2}$ hours, Ruben had collected $\frac{1}{4}$ cup of water. What is the rate, in cups per hour, at which the water is leaking from the faucet?

- A. $\frac{1}{6}$
- B. $\frac{3}{8}$
- C. $\frac{8}{3}$
- D. $\frac{6}{1}$

VF862854

20. Jonah has a recipe that uses $1\frac{1}{2}$ cups of brown sugar and $2\frac{1}{3}$ cups of flour to make 24 muffins. He has a total of 7 cups of flour. Jonah wants to use all of his flour to make as many muffins as possible using this recipe.

Part A

Exactly how many cups of brown sugar will Jonah use if he uses all 7 cups of flour?

- A. $3\frac{3}{10}$ cups
- B. $4\frac{1}{2}$ cups
- C. $7\frac{5}{6}$ cups
- D. $10\frac{8}{9}$ cups

Part B

Exactly how many muffins will Jonah make if he uses all 7 cups of flour?

Enter your answer in the box.

21. A salesperson earns commission on the sales that she makes each month.

- The salesperson earns a 5% commission on the first $5,000 she has in sales.
- The salesperson earns a 7.5% commission on the amount of her sales that are greater than $5,000.

Part A

This month the salesperson had $8,000 in sales. What amount of commission, in dollars, did she earn?

A. $400

B. $475

C. $525

D. $600

Part B

The salesperson earned $1,375 in commission last month. How much money, in dollars, did she have in sales last month?

Enter your answer in the box.

22. **Part A**

At Fairview Middle School, 75 band members need to raise a total of $8,250 for a trip. So far, they have raised $3,120.

How much money, in dollars, per band member, still needs to be raised for the trip?

Enter your answer in the box.

Part B

The entire band decides to have a concert to raise the money for the trip. Tickets for the concert will cost $7.50 each. A local business agrees to donate an additional $0.50 for each $1.00 in ticket sales to the band for their trip.

What is the **least** number of concert tickets the band must sell in order to raise the rest of the money needed for the trip?

Enter your answer in the box.

23. A furniture store had the following sale:

Buy one item at the regular price, get the second item of equal or lesser value for

$\frac{1}{2}$ **off!**

Part A

Mr. Davis bought 2 chairs during the sale. The regular price of each chair was $168.

What was the total price, in dollars, for both chairs during the sale, not including tax?

Enter your answer in the box.

Part B

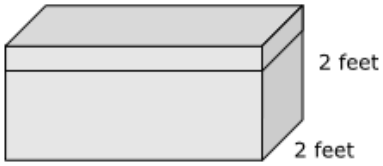
Ms. Wilcox bought a sofa and a chair during the sale. The regular price of the sofa was $875 and the regular price of the chair was $250. After the discount was applied, a sales tax of 6.25% was charged on the total purchase.

How much did Ms. Wilcox pay, in dollars, for the sofa and chair, including tax, during the sale?

Enter your answer in the box.

VF543401

24. A storage chest is shown.



What are the volume and the surface area of this storage chest?

Enter your answers in the boxes.

Volume = ☐ cubic feet

Surface Area = ☐ square feet

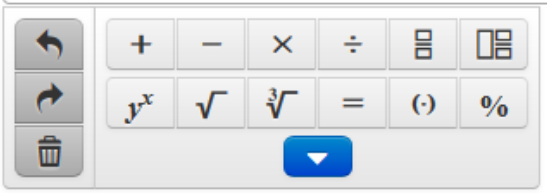
M20908

25. Angle *PQR* and angle *TQV* are vertical angles. The measures of the two angles have a sum of 100°. Write and solve an equation to find *x*, the measure of angle *TQV*.

Enter your equation and your solution in the space provided. Enter **only** your equation and solution.

The equation to find x, the measure of angle TQV, is ☐.

The measure of angle TQV is ☐ degrees.



26. **Part A**

Which sets of measurements could be the interior angle measures of a triangle?

Select **each** correct answer.

- ☐ A. $10^\circ, 10^\circ, 160^\circ$
- ☐ B. $15^\circ, 75^\circ, 90^\circ$
- ☐ C. $20^\circ, 80^\circ, 100^\circ$
- ☐ D. $35^\circ, 35^\circ, 105^\circ$
- ☐ E. $60^\circ, 60^\circ, 60^\circ$

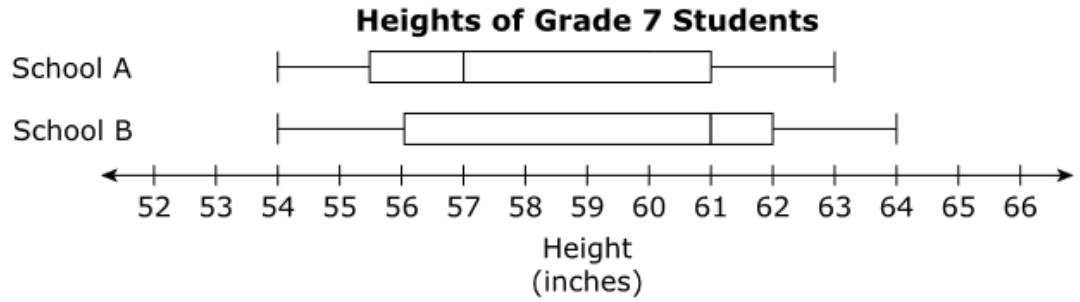
Part B

Which sets of measurements could be the side lengths of a triangle?

Select **each** correct answer.

- ☐ A. 3 cm, 3 cm, 3 cm
- ☐ B. 4 cm, 8 cm, 13 cm
- ☐ C. 5 cm, 9 cm, 14 cm
- ☐ D. 6 cm, 7 cm, 8 cm
- ☐ E. 7 cm, 7 cm, 10 cm

27. The box plot shows the heights of grade 7 students in two random samples from two different schools. The sample from each school is 30% of the student population.



Based on the box plot, which comparison is true?

A. Grade 7 students from School A are typically shorter than grade 7 students from School B because of the difference in the interquartile ranges of grade 7 student heights at the schools.

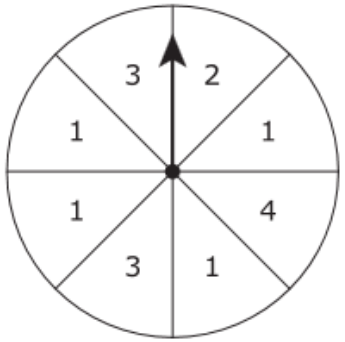
B. Grade 7 students from School A are typically shorter than grade 7 students from School B because of the difference in the medians of grade 7 student heights at the schools.

C. Grade 7 students from School A are typically taller than grade 7 students from School B because of the difference in the interquartile ranges of grade 7 student heights at the schools.

D. Grade 7 students from School A are typically taller than grade 7 students from School B because of the difference in the medians of grade 7 student heights at the schools.

VF646446

28. This spinner is divided into eight equal-sized sections. Each section is labeled with a number.



Jake spins the arrow on the spinner once.

Drag and drop the events into the correct order from least likely to most likely.

Arrow lands on a section labeled with an odd number.	Arrow lands on a section labeled with the number 1.	Arrow lands on a section labeled with a number less than 4.

Least Likely **Most Likely**

M21449

29. Students in a math class will be randomly assigned a polygon for a class project. The only types of polygons being assigned are quadrilaterals, pentagons, hexagons, octagons, nonagons, and decagons. If there is an equal number of each type of polygon, what is the probability that the first polygon assigned will be a nonagon?

Enter your answer in the space provided. Enter **only** your answer.

30. George is building a fence. He builds his fence at a constant rate of $\frac{1}{3}$ section of fence every $\frac{1}{2}$ hour. At this rate, what fraction represents the section of fence George can build per hour? Express your answer as a fraction.

Enter your answer in the boxes.

$$\frac{\square}{\square}$$

31. Students are playing a game. In the game, students collect and trade building materials. Materials of equal value used for trading are shown in the table.

Materials of Equal Value for Trading

1 stone = 4 logs
1 brick = 10 logs
2 logs = 150 nails

Part A

How many stones are needed to trade for 10 bricks?

Enter your answer in the box.

Part B

How many nails are needed to trade for 1 brick?

Enter your answer in the box.

Part C

It takes 39 stones and 165 logs to build 3 sheds.

What is the exact number of stones needed to build 5 sheds?

- A. 13
- B. 65
- C. 195
- D. 234

Part D

What is the exact number of logs needed to build 5 sheds?

- A. 99
- B. 220
- C. 275
- D. 330

32. Ted bought 4 cans of Soup A for $6.00.

For each soup in the table, indicate whether or not the soup has the same price per can as Soup A.

Drag and drop the appropriate phrase into each box.

Has the same price per can as Soup A	Does not have the same price per can as Soup A

Soup B: 2 cans for $5.00

Soup C: 3 cans for $4.50

Soup D: 5 cans for $5.50

Soup E: 6 cans for $9.00

33. Martina read that approximately 10% of all people are left-handed. She wants to design a simulation to approximate the probability of selecting exactly 2 right-handed people when 3 people are randomly selected.

Part A

In the simulation, Martina has a spinner with sections of equal size. One section is labeled "L" (left) and the rest of the sections are labeled "R" (right).

For this simulation to be as accurate as possible, what is the total number of sections that the spinner should have?

Enter your answer in the box.

Part B

Martina spins the arrow on the spinner 3 times and records the resulting letters. Martina performs the simulation 30 times. The results of the simulation are shown.

RRR	RLR	RRR	RRL	RRR	RRR
RRR	RRR	RRR	LRR	RRR	RRR
RRR	RRR	RRR	RRR	RLR	LRL
RRR	RRL	RRR	RRR	LLR	RRR
RRR	RRR	LRR	RRR	RRR	RRR

Select from the drop-down menu to correctly complete the sentence.

Based on the results of this simulation, when 3 people are randomly selected, exactly 2 right-handed people are selected approximately Choose.. percent of the time.

- 10
- 15
- 20
- 25