

# Grade 7 Mathematics Reference Sheet\*

## CONVERSIONS

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilogram

1 kilogram = 2.2 pounds

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallon

1 liter = 1,000 cubic centimeters

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## FORMULAS

Triangle

$$A = \frac{1}{2}bh$$

Parallelogram

$$A = bh$$

Circle

$$A = \pi r^2$$

Circle

$$C = \pi d \text{ or } C = 2\pi r$$

General Prisms

$$V = Bh$$

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**GO ON**

## Practice 1: Book 1

Answer questions 1 through 33. You may use a calculator. Use the  $\pi$  key on your calculator for calculations requiring the value of pi. The use of shortened decimal forms or  $\frac{22}{7}$  are not acceptable.

1

What is the value of the numerical expression  $\frac{5}{8} - \frac{5}{12}\left(3 - \frac{1}{4}\right) + \frac{2}{3}$ ?

A  $-26\frac{5}{24}$

B  $\frac{7}{48}$

C  $1\frac{1}{24}$

D  $1\frac{23}{96}$

2

Rose went to a stationery shop. She purchased 2 packs of red pens, 4 packs of black pens, and 3 packs of blue pens. The cost of each pack of pens was \$2.50. The expression  $\$2.50 \times 2 + \$2.50 \times 4 + \$2.50 \times 3$  represents the total amount of money she spent on pens. How can this expression be rewritten?

A  $\$2.50 \times 2 \times 4 \times 3$

B  $\$2.50 \times (2 + 4 + 3)$

C  $\$2.50 + (2 \times 4 \times 3)$

D  $\$2.50 + 2 + 4 + 3$

**3**

What is  $\frac{14}{15} - \frac{5}{12}$  written as a decimal?

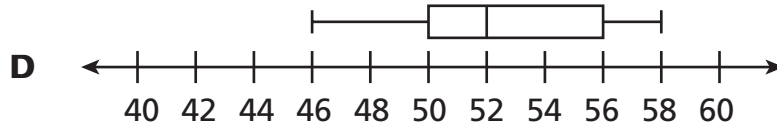
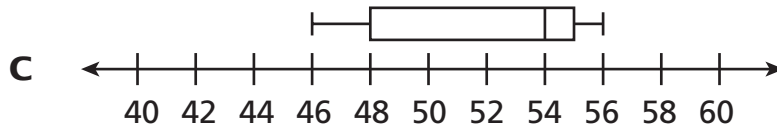
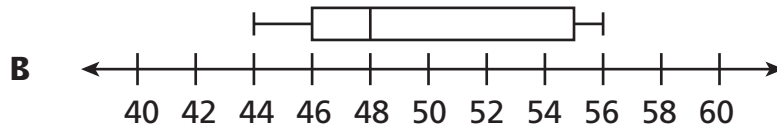
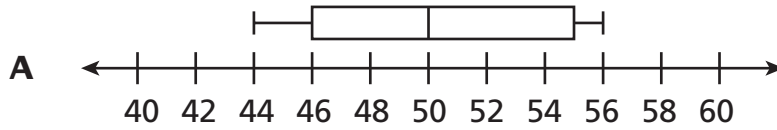
- A 0.15
- B 0.4
- C  $0.51\overline{6}$
- D 3

**4**

The heights, in inches, of several seventh-grade students at Evan Mills Middle School are listed below.

56, 50, 47, 55, 50, 51, 55, 45, 55, 49, 45, 44

Which box plot **best** displays these data?

**GO ON**

**5** Candice bought 3 shirts. Each shirt cost the same amount and was discounted by \$3.66. Candice paid a total of \$62.31 before tax. How much did each shirt cost before the discount?

- A** \$19.55
- B** \$20.77
- C** \$24.43
- D** \$28.09

**6** Dale bought a map of his city. It uses a scale of 1 inch to 8 miles. Dale's house and school are  $1\frac{1}{2}$  inches apart on the map. How far apart would his house and school be on the map if the scale was 1 inch to 6 miles?

- A**  $1\frac{1}{8}$  inches
- B**  $1\frac{3}{4}$  inches
- C** 2 inches
- D** 4 inches

**7** A proportional relationship is represented by the equation  $2x = 18y$ . If  $y = kx$ , where  $k$  is the constant of proportionality, then what is the value of  $k$ ?

- A** 9
- B** 2
- C**  $\frac{1}{2}$
- D**  $\frac{1}{9}$

**8**

Which expression represents the sum of  $\frac{2}{3}m - 1\frac{1}{6}$  and  $\frac{5}{6}m - 1\frac{1}{3}$ ?

- A**  $1\frac{1}{2}m + 2\frac{1}{2}$
- B**  $\frac{1}{6}m - \frac{1}{3}$
- C**  $1\frac{1}{2}m - 2\frac{1}{2}$
- D**  $\frac{1}{6}m + \frac{1}{3}$

**9**

The sum of three numbers is  $-44.84$ . One of the numbers is  $24.6$ . The other two numbers are equal to each other. What is the value of each of the other two numbers?

- A**  $4.36$
- B**  $-10.12$
- C**  $-34.72$
- D**  $-40.48$

**10**

Which situation could be solved using the equation  $-4 + 4 = 0$ ?

- A** Terrance has \$4 in his lunch account. He deposits \$4 in his account when he gets to school in the morning.
- B** Juanita recorded a temperature of  $-4^{\circ}\text{F}$  at 8:00 A.M. An hour later, the temperature increased  $4^{\circ}$ .
- C** Griffin places 4 counters, each representing  $-1$ , in a group. He creates a total of 4 identical groups.
- D** Melinda walks 4 blocks toward her home and stops to get a snack. She walks the remaining 4 blocks home.

**GO ON**

**11**

A bakery has a fixed cost of \$119.75 per day plus \$2.25 for each pastry. The bakery would like to keep its daily costs at or below \$500 per day. Which inequality shows the maximum number of pastries,  $p$ , that can be baked each day?

- A**  $2.25 + 119.75p \leq 500$ ;  $p \leq 416$
- B**  $(119.75 + 2.25)p \leq 500$ ;  $p \leq 409$
- C**  $119.75 + 2.25p \leq 500$ ;  $p \leq 169$
- D**  $2.25p - 119.75 \leq 500$ ;  $p \leq 275$

**12**

Kathy takes her cat to a veterinarian every year for a check-up. Last year, the difference in the cat's weight from the year before was  $-1.56$  pounds. This year, the difference in its weight from last year is  $0.73$  pound. What is the difference in the cat's weight from 2 years ago?

- A**  $-2.29$  pounds
- B**  $-2.19$  pounds
- C**  $-0.93$  pound
- D**  $-0.83$  pound

**13**

Mr. and Mrs. Garcia took their three children to see a matinee on Saturday. They spent a total of \$55.50, which included \$29.25 at the concession stand. Each of the movie tickets cost the same amount. Which equation shows the cost of each ticket,  $t$ ?

- A**  $5t = 29.25 + 55.5$ ;  $t = \$16.95$
- B**  $29.25 + 3t = 55.5$ ;  $t = \$8.75$
- C**  $29.25 + 5t = 55.5$ ;  $t = \$5.25$
- D**  $6t = 55.5 - 29.25$ ;  $t = \$5.00$

**14**

The figure below shows the distance between two cities on a map. The scale of the map is  $\frac{1}{8}$  inch to 12 miles.



The Mitchell family drove from Lee Springs to Boothville in  $3\frac{3}{4}$  hours. What was their approximate average speed?

- A** 38.4 miles per hour
- B** 44.8 miles per hour
- C** 54.4 miles per hour
- D** 57.6 miles per hour

**15**

Brett took a test in which 2 points were earned for each correct response and  $-\frac{1}{2}$  point was earned for each incorrect response. He answered 35 questions correctly and 15 questions incorrectly, so his total number of points was  $35(2) + \left[-\frac{1}{2}(15)\right]$ . Which is another way to write Brett's total number of points on the test?

- A**  $15(2) + \left[-\frac{1}{2}(35)\right]$
- B**  $15(2) + \frac{1}{2}(35)$
- C**  $35(2) - \left[-\frac{1}{2}(15)\right]$
- D**  $35(2) - \frac{1}{2}(15)$

**GO ON**

**16**

Veronica randomly surveyed a group of students to find out how they arrived at school that morning. The data she gathered are in the table below.

### HOW STUDENTS ARRIVED AT SCHOOL

	Walked	Car	Bicycle	Bus
Number of Students	8	7	3	42

Which statement about the 540 total students at Veronica's school is **best** supported by the data?

- A** Many more students walk to school than arrive by car.
- B** About 380 students take the bus to school.
- C** Fewer than 20 students ride bicycles to school.
- D** About 140 students walk to school.

**17**

Blake plays football. Last year, he averaged 280 passing yards per game during his team's 9-game season. The school record for total passing yards in a season is 3,114 yards. If Blake increases his passing yards per game by 25% during this year's 9-game season, how close will he come to breaking the record?

- A** He will break the record by 36 yards.
- B** He will break the record by 29 yards.
- C** He will be 369 yards short of breaking the record.
- D** He will be 531 yards short of breaking the record.



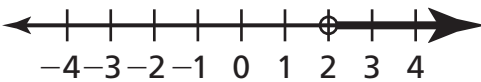
**18**

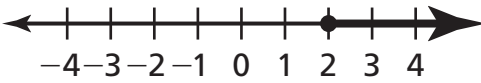
Piper works at a camera store. He is paid an hourly rate plus 16% commission on everything he sells. One week, he was paid \$515 for working 20 hours and selling \$1,500 worth of camera equipment. What is his hourly rate?

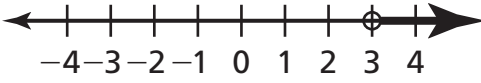
- A \$12.00
- B \$13.75
- C \$21.63
- D \$25.75

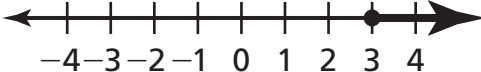
**19**

A pilot is flying an airplane at an elevation of 17,500 feet. She is increasing her elevation at a rate of 2,500 feet per minute. Which number line shows the solution set for the number of minutes the pilot could increase her elevation and be above 25,000 feet?

- A 

A number line with arrows at both ends, labeled from -4 to 4. An open circle is drawn at the number 2.
- B 

A number line with arrows at both ends, labeled from -4 to 4. A closed circle is drawn at the number 2.
- C 

A number line with arrows at both ends, labeled from -4 to 4. An open circle is drawn at the number 3.
- D 

A number line with arrows at both ends, labeled from -4 to 4. A closed circle is drawn at the number 3.

**GO ON**

**20**

Peter made two transactions today at his bank. Which is the most likely meaning of the sum  $-47.27 + 598 = 550.73$  in terms of Peter's bank account?

- A** Peter deposited \$47.27 and withdrew \$598, decreasing his balance by \$550.73.
- B** Peter deposited \$47.27 and withdrew \$598, increasing his balance by \$550.73.
- C** Peter withdrew \$47.27 and deposited \$598, decreasing his balance by \$550.73.
- D** Peter withdrew \$47.27 and deposited \$598, increasing his balance by \$550.73.

**21**

Yana and Amber play a word game using letter tiles. Each person takes 7 tiles from a set of tiles. Points are earned by using the chosen letter tiles to make a word. Points are lost when tiles are returned to the set and new tiles are chosen. The table shows the points earned or lost by each girl in their first six turns of the game.

Yana	Amber
7	1
-3	5
6	-2
-1	4
8	-2
-2	6

Which statement correctly compares the two girls' average number of points earned over the first six turns?

- A** Yana's average number of points is 0.5 point greater than Amber's.
- B** Amber's average number of points is 1 point greater than Yana's.
- C** Amber's average number of points is 2 points greater than Yana's.
- D** Yana's average number of points is 2.5 points greater than Amber's.

**22**

Bethany needs to cut a board into 5 equal sections. If the board is 17.55 feet long, what will be the length of each section?

- A** 3.51 feet
- B** 4.55 feet
- C** 22.55 feet
- D** 87.75 feet

**23**

Which fraction equals  $\frac{-9}{16}$ ?

- A**  $\frac{-3}{4}$
- B**  $\frac{9}{-16}$
- C**  $\frac{9}{16}$
- D**  $\frac{3}{4}$

**GO ON**

**24**

Shamay spent \$200 at a department store. She bought 3 rings for \$21 each and spent the rest on 4 equally-priced bracelets. How much did each bracelet cost?

- A** \$65.75
- B** \$50.00
- C** \$34.25
- D** \$28.57

**25**

Emma is making a scale drawing of her farm using the scale 1 centimeter to 2.5 feet. In the drawing, she drew a well with a diameter of 0.5 centimeter. Which is closest to the actual circumference of the well?

- A** 1 foot
- B** 2 feet
- C** 4 feet
- D** 5 feet

**26**

A fire department spent \$900 to purchase new helmets and gloves. The amount included a 6% sales tax. What was the price of the equipment, **to the nearest dollar**, before tax?

- A** \$846
- B** \$849
- C** \$854
- D** \$894

**27**

Which table shows a proportional relationship between  $x$  and  $y$ ?

$x$	$y$
25	5
30	6
40	8

**A**

$x$	$y$
25	5
30	10
40	20

**C**

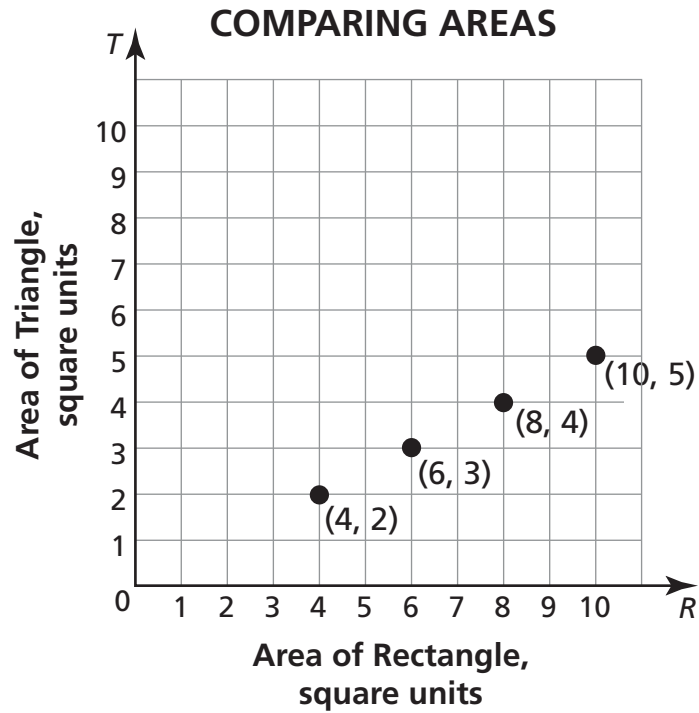
$x$	$y$
25	5
30	4
40	3

**B**

$x$	$y$
25	35
30	40
40	50

**D****GO ON**

The graph below shows the proportional relationship between the area of a triangle,  $T$ , and the area of a rectangle,  $R$ , with identical base length and height.

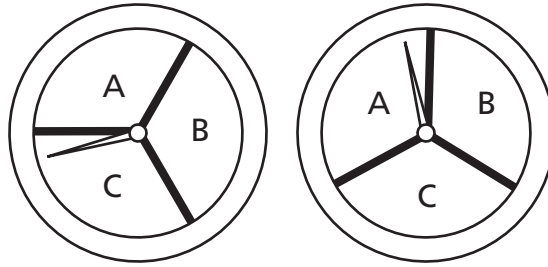


Which equation represents the relationship between  $T$  and  $R$ ?

- A**  $T = 2R$
- B**  $T = \frac{1}{2}R$
- C**  $R = \frac{1}{2}T$
- D**  $R = \frac{2}{T}$

**29**

During an experiment Natalie will spin the 2 fair spinners below.



Which answer represents the sample space for this experiment?

- A** (A, A) (A, B) (A, C) (B, A) (B, B) (B, C) (C, A) (C, B) (C, C)
- B** (A, B) (A, C) (B, A) (B, C) (C, A) (C, B)
- C** (A, B) (B, C) (C, A) (C, A) (A, B) (B, C) (B, C) (C, A) (A, B)
- D** (A, A) (B, B) (C, C)

**30**

Each month, Nelson pays \$0.08 per text message that he sends or receives, plus a \$10 fee. Nelson's bill for February was \$44.56. How many text messages did Nelson send or receive in February?

- A** 307
- B** 432
- C** 557
- D** 682

**31**

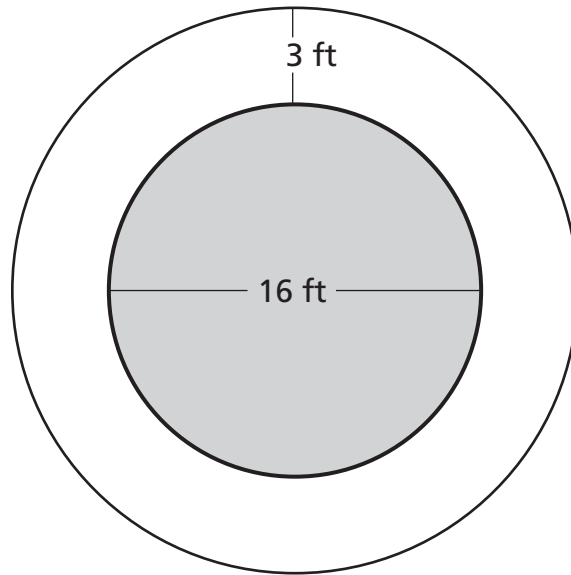
Which expression is equivalent to  $2.8k - 8.4$ ?

- A**  $0.07(4k - 12)$
- B**  $0.7(4k - 12)$
- C**  $5.6k$
- D**  $-5.6k$

**GO ON**

**32**

The fountain in the middle of a park is circular, with a diameter of 16 feet. There is a walkway that is 3 feet wide that goes around the fountain.

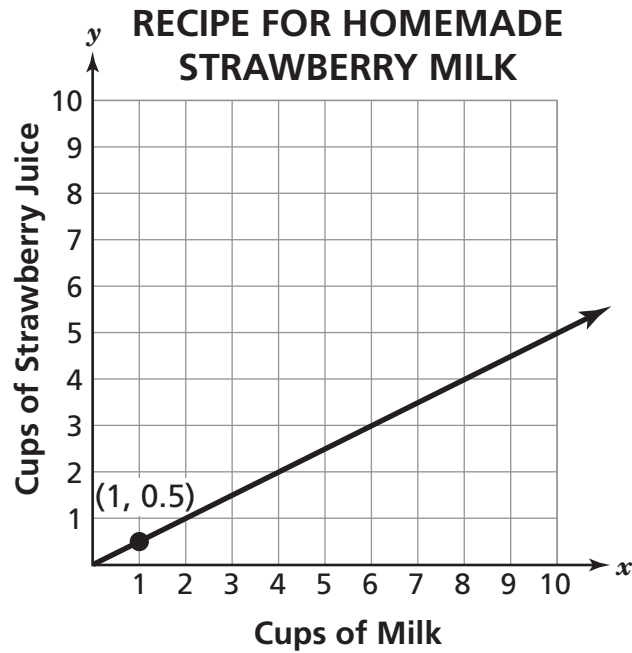


What is the approximate area of the walkway?

- A** 179 square feet
- B** 159 square feet
- C** 28 square feet
- D** 16 square feet



The graph below shows the proportional relationship between the number of cups of milk and the number of cups of strawberry juice in a recipe for homemade strawberry milk.



What is the meaning of the point  $(1, 0.5)$ ?

- A** For every 0.5 cup of milk, there should be 0.5 cup of strawberry juice.
- B** For every 0.5 cup of milk, there should be 1 cup of strawberry juice.
- C** For every 1 cup of milk, there should be 0.5 cup of strawberry juice.
- D** For every 1 cup of milk, there should be 1 cup of strawberry juice.

**STOP**