# TIMSS 2019 – Restricted Use Items – Numbers

Benchmark 2

Knowing

On Thursday, the lowest temperature in City X was 6 °C and the lowest temperature in City Y was –3 °C. What was the difference between the lowest temperatures in the cities?

Answer: _____ °C

Benchmark 3

Applying

A piece of string was 45 cm long. Then, it was divided into two pieces in a ratio of 4:5.

What is the length of the shorter piece of string in cm?

Ⓐ 5

Ⓑ 20

Ⓒ 25

Ⓓ 36

Benchmark 4

Reasoning

In the square below:

- The numbers in each row add to 1,
- The numbers in each column add to 1, and
- The numbers in both diagonals add to 1.

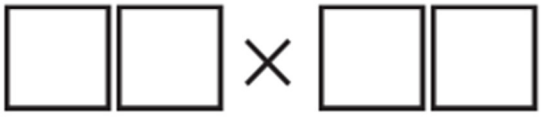
| | | |
|---|---|---|
| $\frac{8}{15}$ | | $\frac{2}{5}$ |
| $\frac{1}{5}$ | $X$ | |
| | | |

What is the value of $X$?

$X =$ _____

Reasoning

Write each of the digits 1, 2, 3, and 4 in a box below to make the **smallest** product. Each digit may only be used once.



# TIMSS 2019 – Restricted Use Items – Algebra

Benchmark 3

Applying

The stopping distance ($d$) meters depends on the speed ($v$) meters per second of the car when the brakes are applied. A formula for calculating this distance is:

$$d = \frac{2v + v^2}{20}$$

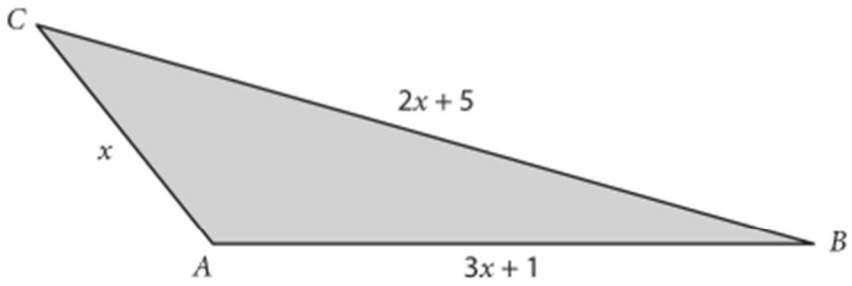
What is the stopping distance when $v = 20$?

$d =$ _____ m

Benchmark 4

Applying

The perimeter of triangle $ABC$ is 21 cm.




What is the value of $x$ ?

$x =$ _____ cm

Applying

Roy buys cell phones for $x$ zeds each and sells them to make a profit. He determines his selling price for each phone, $y$ zeds, by doubling the price he paid and subtracting 3 zeds.

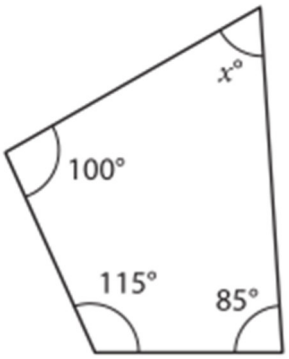
Write an equation that shows $y$ in terms of $x$.

Equation: _____

# TIMSS 2019 – Restricted Use Items –Geometry

Benchmark 2

Applying



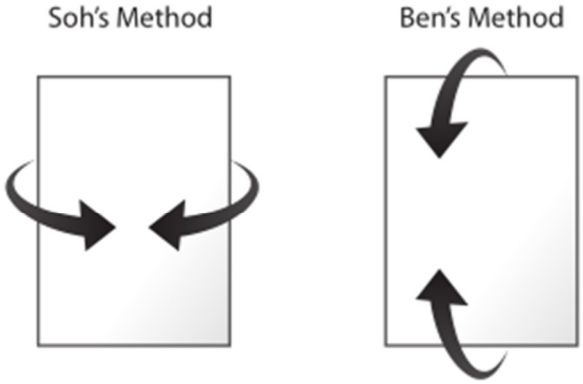

What is the value of $x$ ?

$x =$ _____

Benchmark 3

Reasoning

Soh and Ben have identical rectangular pieces of paper. They use different ways to roll their papers into cylinders so that the opposite sides of the paper touch as shown below.




Compare the properties of the two cylinders.

Use > , < , or = for each.

**Height**

Soh's cylinder _____ Ben's cylinder

**Diameter**

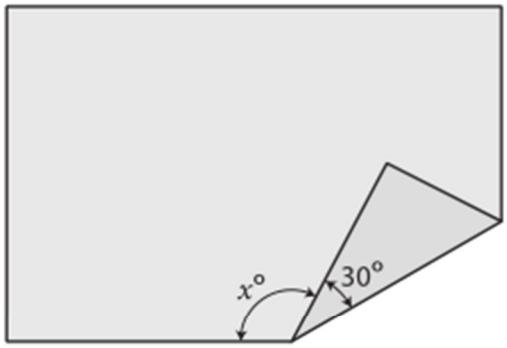
Soh's cylinder _____ Ben's cylinder

**Surface Area (open ends)**

Soh's cylinder _____ Ben's cylinder

Benchmark 4

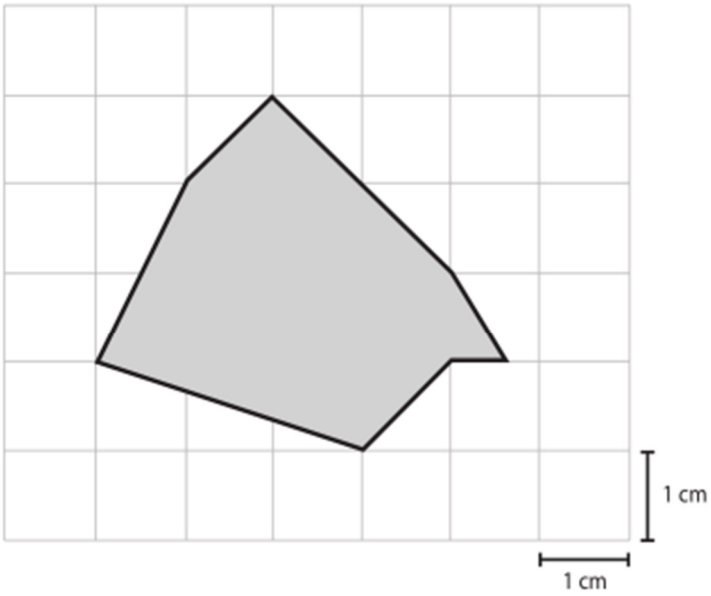
Reasoning




A rectangular piece of paper is folded at one corner, as shown above. What is the value of $x$ ?

Answer: _____

Applying




Which is the best estimate of the shaded area?

Ⓐ 6 $cm^2$

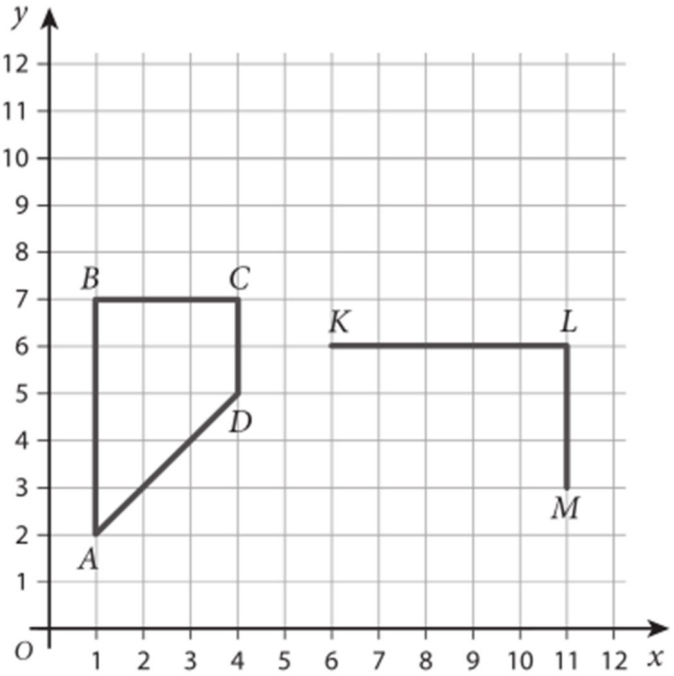
Ⓑ 8 $cm^2$

Ⓒ 10 $cm^2$

Ⓓ 12 $cm^2$

Reasoning

Woo drew trapezoid *ABCD*. He then started drawing a **congruent** trapezoid *KLMN*.




What will be the coordinates of point *N* when Woo completes the figure?

Answer: ( _____, _____ )

# TIMSS 2019 – Restricted Use Items – Data and Probability

Benchmark 2

Applying

**Socks on Sale!**
Advertisements

**SALE**
Store Q
6 pairs of socks
24.30 zeds

**SALE**
Store R
2 pairs of socks
8.40 zeds

**SALE**
Store S
4 pairs of socks
16.40 zeds

**SALE**
Store T
3 pairs of socks
12 zeds

Chen has seen these advertisements for socks and wants to pay the lowest price per pair of socks. Complete the table below to show Chen the price per pair of socks in each store. Store Q has been done for you.

| Store | Price Per Pair |
|---|---|
| Q | 4.05 zeds |
| R | |
| S | |
| T | |

From which store should Chen buy her socks in order to pay the lowest price per pair?

Store: _____

Benchmark 3

Applying

Lee wants to make three graphs to show information about his town.

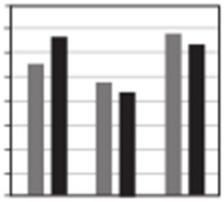
Which type of graph is best for each title?

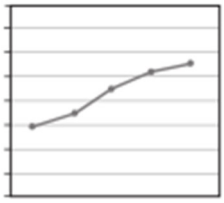
Draw a line to match each title to the best type of graph.

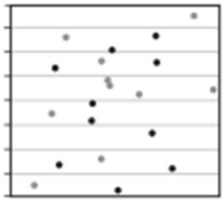
**Job Types of Workers in Town**

**The Number of Girls and Boys Born Each Year**

**Town Population Over Time**







Benchmark 3

Applying

A bag contains 24 marbles, some white and some black.

A marble is chosen at random, its color is noted, and the marble is placed back into the bag. This is done 120 times, and a white marble appears 70 times.

How many white marbles are likely to be in the bag?

Ⓐ 7

Ⓑ 10

Ⓒ 12

Ⓓ 14

Benchmark 4

Applying

A relay team for a 400 m race has 4 runners. They took 12 seconds, 13 seconds, 11 seconds, and 13 seconds, respectively, to complete their legs of the race.

A. What is the mean time it takes the runners to complete their legs?

Ⓐ 13.0 sec.

Ⓑ 12.5 sec.

Ⓒ 12.25 sec.

Ⓓ 11.5 sec.

B. In the next race, 2 of the runners each improved their times by 2 seconds, and the other 2 had the same times as before. By how many seconds did the team's mean running time improve?

Ⓐ 0 sec.

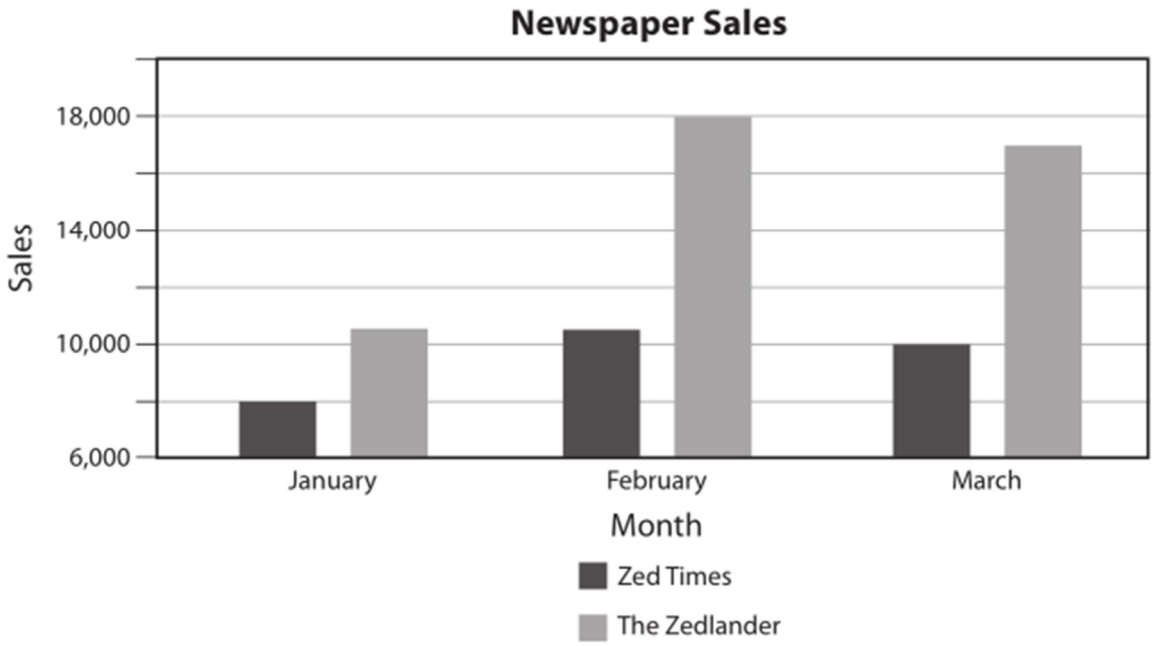
Ⓑ 1 sec.

Ⓒ 2 sec.

Ⓓ 4 sec.

Reasoning

The graph shows the sales of two Zedland newspapers over three months.




Nancy claimed that sales for the Zedlander were more than double the sales for Zed Times each month.

Explain why Nancy's claim is **incorrect**.