Ann and Jenny divide 560 zeds between them. If Jenny gets $\frac{3}{8}$ of the money, how many zeds will Ann get?

Answer: _____

$$\frac{4}{100} + \frac{3}{1000} =$$

A.   0.043
B.   0.1043
C.   0.403
D.   0.43

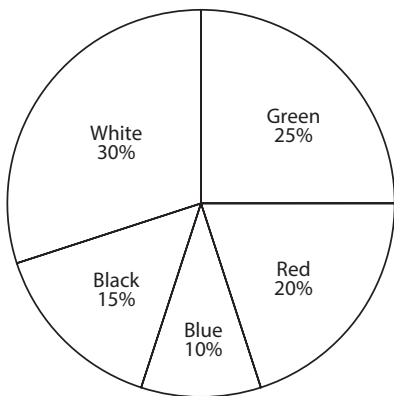Which of these is the BEST estimate of $\dfrac{7.21 \times 3.86}{10.09}$?

A. $\dfrac{7 \times 3}{10}$

B. $\dfrac{7 \times 4}{10}$

C. $\dfrac{7 \times 3}{11}$

D. $\dfrac{7 \times 4}{11}$

Color of Caps

The pie chart shows the percentage of caps for sale at a sporting goods store. If there are 200 caps, what is the total number of caps that are either white or green?

A.   55

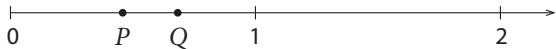B.   100

C.   110

D.   145

Which of these shows how 36 can be expressed as a product of prime factors?

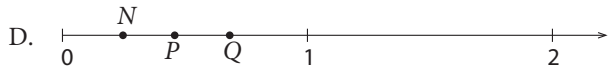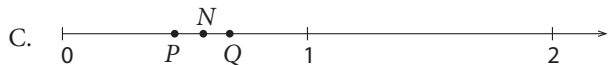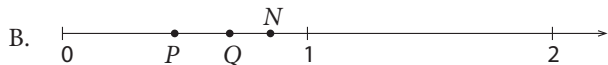A. 6×6

B. 4×9
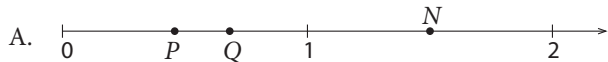
C. $4 \times 3 \times 3$

D. $2 \times 2 \times 3 \times 3$

P and *Q* represent two fractions on the number line above.

$P \times Q = N$.

Which of these shows the location of *N* on the number line?

A.

B.

C.

D.

Write $3\dfrac{5}{6}$ in decimal form, rounded to 2 decimal places.

Answer: _____

Place the four digits 3, 5, 7, and 9 into the boxes below in the positions that would give the greatest result when the two numbers are multiplied.

$$\begin{array}{r} \square\,\square \\ \times\ \square\,\square \\ \hline \end{array}$$

Look at this table:

4^1	4^2	4^3	4^4	4^5	4^6
4	16	64	256	1,024	4,096

Use the table to express the value of $256 \times 4{,}096$ as a power of 4.

A. 4^{10}

B. 4^{16}

C. 4^{20}

D. 4^{24}

Which number does *K* represent on this number line?

A. 27.4

B. 27.8

C. 27.9

D. 28.2

The fractions $\dfrac{4}{14}$ and $\dfrac{\square}{21}$ are equivalent.

What is the value of $\square$?

A. 6

B. 7

C. 11

D. 14

Which fraction is equivalent to 0.125?

A. $\dfrac{125}{100}$

B. $\dfrac{125}{1,000}$

C. $\dfrac{125}{10,000}$

D. $\dfrac{125}{100,000}$

A workman cut off $\frac{1}{5}$ of a pipe. The piece he cut off was 3 meters long.

How many meters long was the original pipe?

A.   8 m

B.   12 m

C.   15 m

D.   18 m

Peter, James, and Andrew each had 20 tries at throwing balls into a basket.

Complete the missing boxes below.

Name	Number of Successful Shots	Percentage of Successful Shots
Peter	10 out of 20	50 %
James	15 out of 20	☐
Andrew	☐ out of 20	80%

Here is a pattern:

$3 - 3 = 0$

$3 - 2 = 1$

$3 - 1 = 2$

$3 - 0 = 3$

What will the next line in the pattern be?

Answer: _____

Kim is packing eggs into boxes.

Each box holds 6 eggs.

She has 94 eggs.

What is the smallest number of boxes she needs to pack all the eggs?

Answer: _____ boxes

Which of these number sentences is true?

A. $\dfrac{3}{10}$ of 50 = 50% of 3

B. 3% of 50 = 6% of 100

C. 50 ÷ 30 = 30 ÷ 50

D. $\dfrac{3}{10} \times 50 = \dfrac{5}{10} \times 30$

Which number is equal to $\frac{3}{5}$?

A.   0.8

B.   0.6

C.   0.53

D.   0.35

Which shows a correct method for finding $\frac{1}{3} - \frac{1}{4}$?

A. $\dfrac{1 - 1}{4 - 3}$

B. $\dfrac{1}{4 - 3}$

C. $\dfrac{3 - 4}{3 \times 4}$

D. $\dfrac{4 - 3}{3 \times 4}$

42.65 + 5.748 =

Answer: _____

What is the sum of the three consecutive whole numbers with $2n$ as the middle number?

A. $6n + 3$

B. $6n$

C. $6n - 1$

D. $6n - 3$

There were *m* boys and *n* girls in a parade. Each person carried 2 balloons. Which of these expressions represents the total number of balloons that were carried in the parade?

A. $2(m + n)$

B. $2 + (m + n)$

C. $2m + n$

D. $m + 2n$

Bush height (cm)	Shadow length (cm)
20	16
40	32
60	48
80	64

The table above shows the shadow lengths of four bushes of different heights at 10 a.m. What is the shadow length at 10 a.m. of a bush that has a height of 50 centimeters?
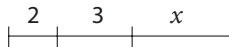
A. 36 cm

B. 38 cm

C. 40 cm

D. 42 cm
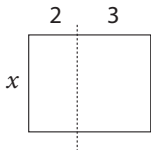
Which of these could represent the expression $2x + 3x$?

A. The length of this segment:
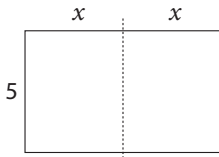

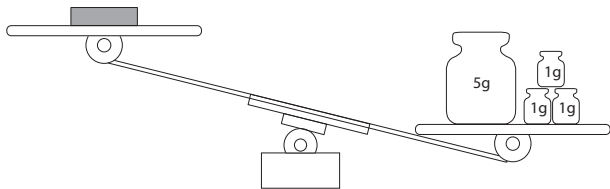B. The length of this segment:

C. The area of this figure:
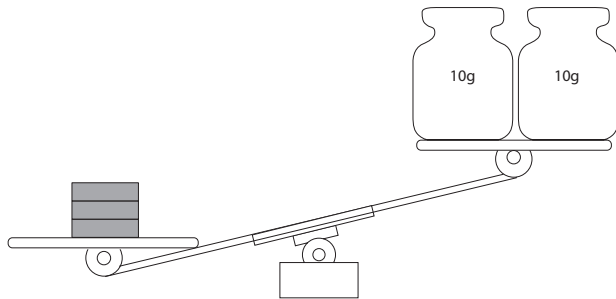

D. The area of this figure:

Jo has three metal blocks. The weight of each block is the same.
When she weighed one block against 8 grams, this is what happened.

When she weighed all three blocks against 20 grams, this is what happened.

Which of the following could be the weight of one metal block?

A.   5 g

B.   6 g

C.   7 g

D.   8 g

The taxi company has a basic charge of 25 zeds and a charge of 0.2 zeds for each kilometer the taxi is driven. Which of these represents the cost in zeds to hire a taxi for a trip of n kilometers?

A. $25 + 0.2n$

B. $25 \times 0.2n$

C. $0.2 \times (25 + n)$

D. $0.2 \times 25 + n$

Use the formula $y = 100 - \dfrac{100}{1+t}$ to find the value of y when $t = 9$.

Answer: _____

If *t* is a number between 6 and 9, then *t* + 5 is between what two numbers?

A. 1 and 4

B. 10 and 13

C. 11 and 14

D. 30 and 45

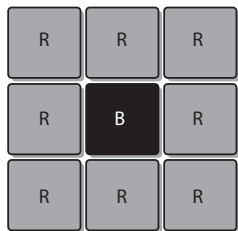Simplify the expression $\dfrac{3x}{8} + \dfrac{x}{4} + \dfrac{x}{2}$. Show your work.

Answer: _____

What does $xy + 1$ mean?
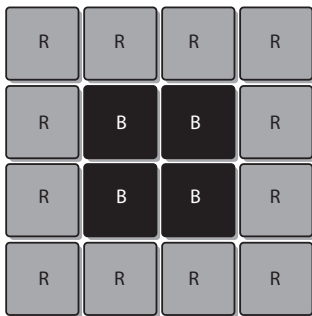
A.   Add 1 to y, then multiply by x.

B.   Multiply x and y by 1.

C.   Add x to y, then add 1.

D.   Multiply x by y, then add 1.

Pat has red tiles and black tiles. Pat uses the tiles to make square shapes.

The 3 × 3 shape has
1 black tile and 8 red tiles.

R	R	R
R	B	R
R	R	R

B = Black tile

R = Red tile

The 4 × 4 shape has 4 black
tiles and 12 red tiles.

R	R	R	R
R	B	B	R
R	B	B	R
R	R	R	R

The table below shows the number of tiles for the first three shapes Pat made. Pat
continued making shapes using this pattern. Complete the table for the 6 × 6 and
7 × 7 shapes.

Shape	Number of Black Tiles	Number of Red Tiles	Total Number of Tiles
3 × 3	1	8	9
4 × 4	4	12	16
5 × 5	9	16	25
6 × 6	16		
7 × 7	25		

Red and Black Tiles (Continued)

Use the patterns in the previous table to answer the following questions.

A. Pat made a shape with a **total** of 64 tiles.
   How many were black and how many were red?

   Answer: _____ black tiles   _____ red tiles

Red and Black Tiles (Continued)

Use the patterns in the previous table to answer the following questions.

B. Pat made a shape that used 49 **black** tiles.
   How many **red** tiles did Pat use in that shape?

   Answer: _____ red tiles

Red and Black Tiles (Continued)

Use the patterns in the previous table to answer the following questions.

C. Next, Pat made a shape using 44 of the **red** tiles. How many black tiles would Pat need to complete the black part of the shape?

Answer: _____ black tiles

Pat wanted to add a line to the table showing how to find the number of tiles needed to make a square of any size. Use the patterns in the table on the opposite page to help you complete the line for shape $n \times n$ in the table below.

Shape	Number of Black Tiles	Number of Red Tiles	Total Number of Tiles
$n \times n$	$(n - 2)^2$		
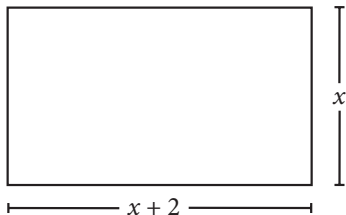
What is the area of this rectangle?

A. $x^2 + 2$

B. $x^2 + 2x$

C. $2x + 2$

D. $4x + 4$

Which expression is equivalent to $4(3 + x)$?

A. $12 + x$

B. $7 + x$

C. $12 + 4x$

D. $12x$

$a + b = 25$.
What is the value of $2a + 2b + 4$?

Answer: _____

Solve this inequality.

$9x - 6 < 4x + 4$

Answer: _____

$$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$$

A. What is the next term in this pattern?

Answer: _____

$$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$$

B. What would term number 100 be?

Answer: _____

$$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$$

C. What would term number *n* be?

Answer: _____

$k = 7$ and $l = 10$.

What is the value of P when $P = \dfrac{3kl}{5}$?

Answer: _____
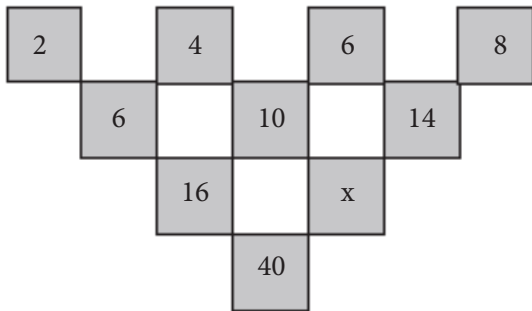
What is the value of *x* in this pattern?

Answer: _____

$x + y = 12$ and $2x + 5y = 36$.

What are the values of x and y?

A. $x = 2, y = 10$

B. $x = 4, y = 8$

C. $x = 6, y = 6$

D. $x = 8, y = 4$

Which of these is equal to $3p^2 + 2p + 2p^2 + p$?

A. $8p$

B. $8p^2$

C. $5p^2 + 3p$

D. $7p^2 + p$

$(0, -1)$, $(1, 3)$

Which equation is satisfied by BOTH of these pairs of numbers (x, y)?

A. $x + y = -1$

B. $2x + y = 5$

C. $3x - y = 0$

D. $4x - y = 1$

A piece of wood was 40 cm long.

It was cut into 3 pieces.

The lengths in cm are

$2x - 5$

$x + 7$

$x + 6$

A. What is the length of the longest piece?

Answer: _____ cm

B. Show your work. If you use a calculator, you still must describe all the steps you used to obtain your answer.
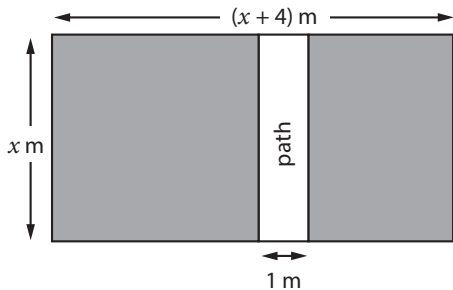
This is a diagram of a rectangular garden.

The white area is a rectangular path that is 1 meter wide.

Which expression shows the area of the shaded portion of the garden in m²?

A. $x^2 + 3x$

B. $x^2 + 4x$

C. $x^2 + 4x - 1$

D. $x^2 + 3x - 1$

$$y = \frac{a + b}{c}$$

$a = 8$, $b = 6$, and $c = 2$

What is the value of y?

A.   7

B.   10

C.   11

D.   14
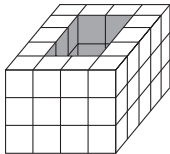
The figure above shows a shape made up of cubes that are all the same size. There is a hole all the way through the shape. How many cubes would be needed to fill the hole?

A.   6

B.   12

C.   15

D.   18

The area of a square is 144 cm². What is the perimeter of the square?

A.   12 cm

B.   48 cm

C.   288 cm

D.   576 cm

Points *A*, *B*, and *C* lie on a line and *B* is between *A* and *C*. If *AB* = 10 cm and *BC* = 5.2 cm, what is the distance between the midpoints of *AB* and *BC*?

A. 2.4 cm

B. 2.6 cm

C. 5.0 cm

D. 7.6 cm

How many degrees does a minute hand of a clock turn through from 6:20 a.m. to 8:00 a.m. on the same day?

A. 680°

B. 600°

C. 540°

D. 420°
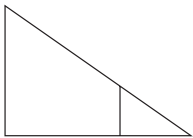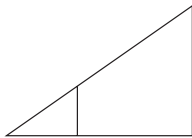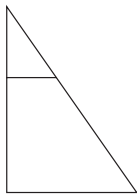
Figure 1   Figure 2   Figure 3

Which of these transformations, taken in order, can be used so that
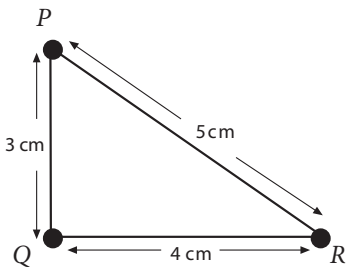Figure 1 above becomes Figure 2 and then Figure 3?

A. reflection and then translation

B. reflection and then $\frac{1}{4}$ turn rotation clockwise

C. $\frac{1}{2}$ turn rotation and then translation

D. $\frac{1}{4}$ turn rotation counterclockwise and then reflection
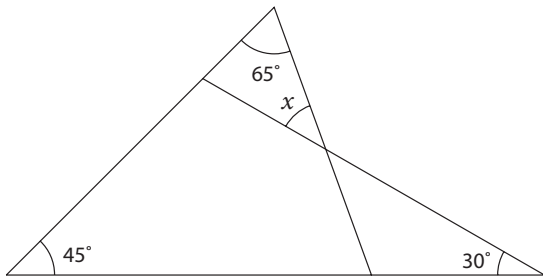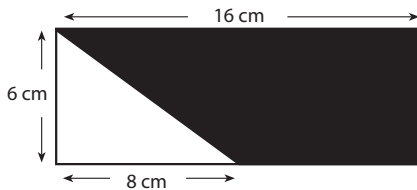
In the figure above, what is the value of *x*?

A. 30°

B. 40°

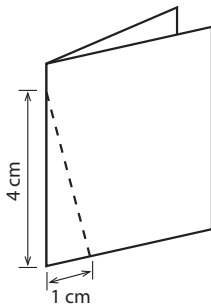C. 45°

D. 65°

Which of these is the reason that triangle *PQR* is a right angle triangle?

A. $3^2 + 4^2 = 5^2$

B. $5 < 3 + 4$

C. $3 + 4 = 12 - 5$

D. $3 > 5 - 4$

In the figure above, what is the area of the shaded region in cm²?

A. 24

B. 44

C. 48

D. 72

A piece of paper in the shape of a rectangle is folded in half as shown in the figure above. It is then cut along the dotted line, and the small piece that is cut is opened. What is the shape of the cutout figure?

A.   an isosceles triangle

B.   two isosceles triangles

C.   a right triangle

D.   an equilateral triangle
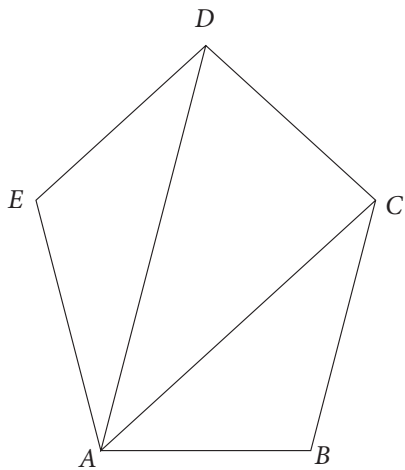
What is the sum of all the interior angles of pentagon *ABCDE*?
Show your work.

Answer: _____
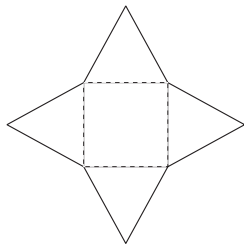
The shape shown above is cut out of cardboard. The triangle flaps are then folded up along the dotted lines until they touch the edges of the flaps next to them.

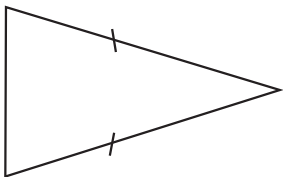Complete the diagram below to show what the shape would look like when viewed from directly above.
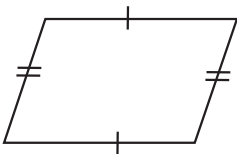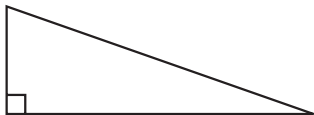
Which shape has a line of symmetry?

A.

B.

C.
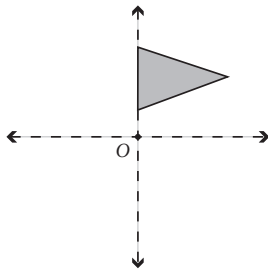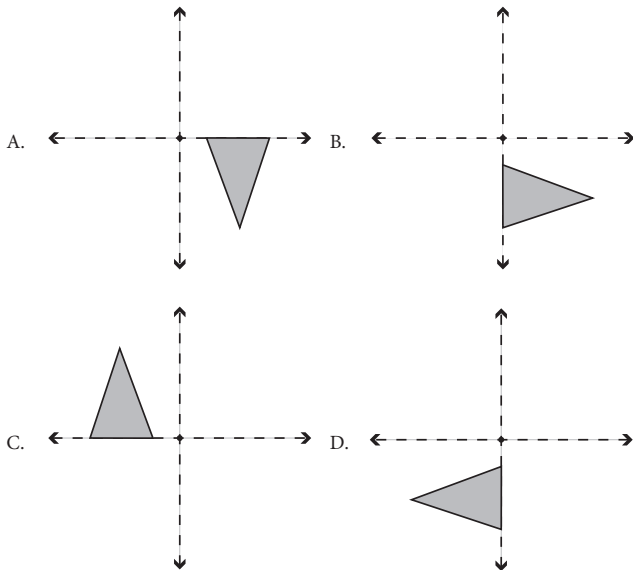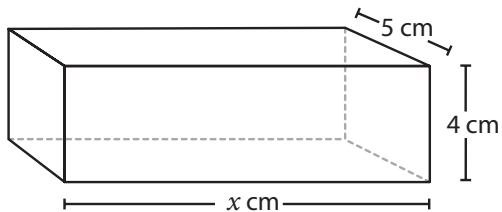
D.

Which of these shows the result of a half-turn clockwise around point *O*?

A.

B.

C.

D.

The volume of the rectangular box is 200 cm³. What is the value of x?

Answer: _____

The length of side of each of the small squares represents 1 cm. Draw an isosceles triangle with a base of 4 cm and a height of 5 cm.
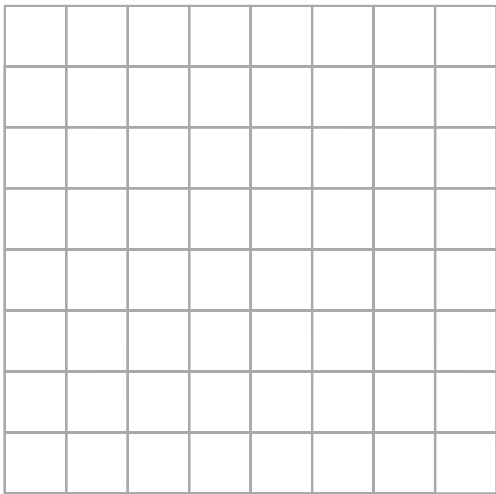
The diagram shows a system for locating points
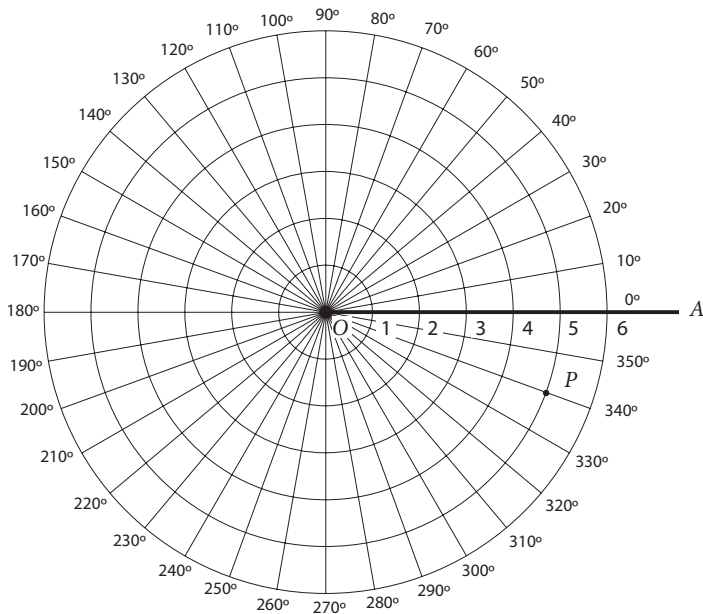
In this system, the position of a point *P* is described by its distance from origin, *O*, and the amount of counterclockwise turn from a baseline *OA* to *OP*. Thus, the coordinates of *P* are (5, 340°).

A. Mark the points *B* (3, 30°) and *C* (4, 120°) on the graph above.

B. Draw the angle *BOC*. What is the measure of angle *BOC*?

Angle *BOC* = _____°

The perimeter of a square is 36 cm.

What is the area of this square?

A.   81 cm^2

B.   36 cm^2

C.   24 cm^2

D.   18 cm^2

Ryan is packing books into a rectangular box.

All the books are the same size.

Box

30 cm   36 cm

20 cm

Book

6 cm

20 cm   15 cm
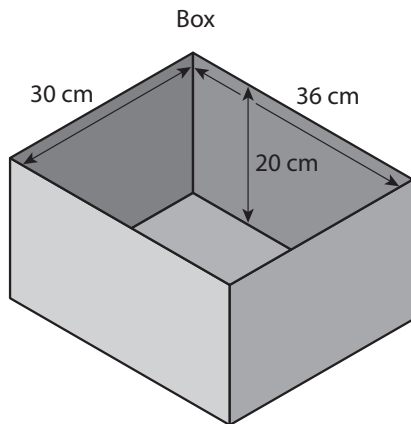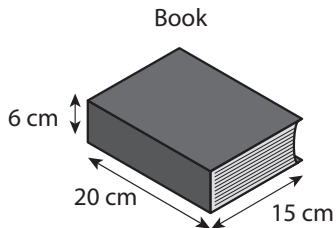
What is the largest number of books that will fit inside the box?

Answer: _____
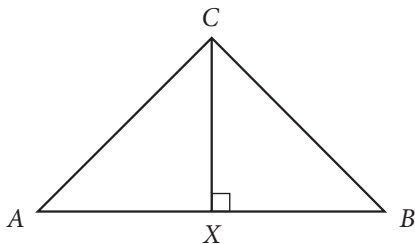
In this triangle:

$AC = BC$

AB is twice as long as CX.

What is the size of angle B?

Answer: _____ °
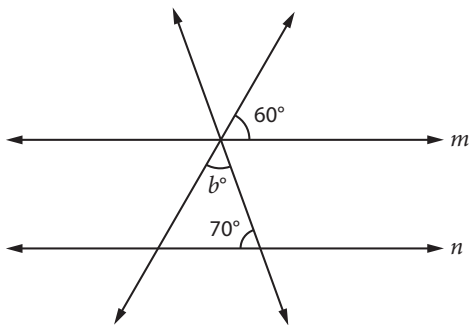
Lines *m* and *n* are parallel.

What is the value of *b*?

Answer: _____

A machine has 100 candies and dispenses a candy when a lever is turned. The machine has the same number of blue, pink, yellow, and green candies all mixed together. Megan turned the lever and obtained a pink candy. Peter turned the lever next.

How likely is it that Peter will get a pink candy?

A.   It is certain that his candy will be pink.

B.   It is more likely than it was for Megan.

C.   It is exactly as likely as it was for Megan.

D.   It is less likely than it was for Megan.
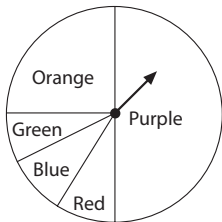
The spinner is for Steve's new game. Out of 600 spins, approximately how many times should he expect the arrow to land on the red sector?

A. 30

B. 40

C. 50

D. 60
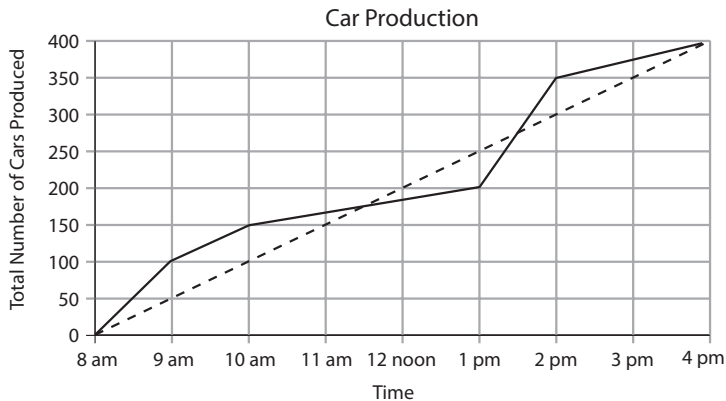
Car Production

The solid line (——) on the graph shows car production by the NU Car Motor Company during a particular day.

The dotted line (-----) shows what the total number of cars produced would be if the rate of production were constant.

A. By what time had a total of 150 cars been produced?

Answer: _____

Car Production

The solid line (——) on the graph shows car production by the NU Car Motor Company during a particular day.

The dotted line (-----) shows what the total number of cars produced would be if the rate of production were constant.

B. What was the average number of cars produced per hour on this day?

Answer: _____
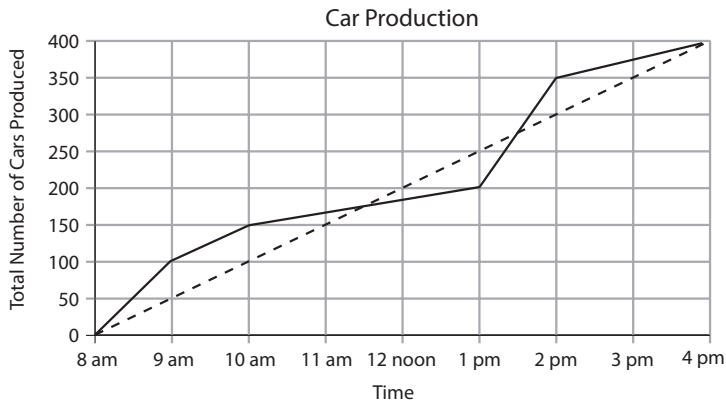
Car Production

The solid line (——) on the graph shows car production by the NU Car Motor Company during a particular day.

The dotted line (-----) shows what the total number of cars produced would be if the rate of production were constant.
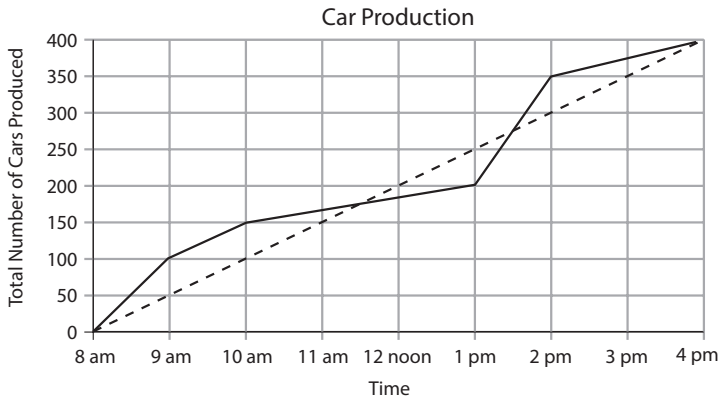
C. During which hour were the most cars produced?

Between _____ and _____

Of the 400 students in a school, 50 plan to go to university, 100 to a polytechnic school, 150 to a business college, and the remainder plan to enter workforce.

Use the circle below to make a pie chart showing the proportions of students planning to do each of these. Put labels on your chart.

Soft Drink Sales

□ Cherry Cola
■ Lemon Cola

Number of cans (millions) — Year: 1998, 1999, 2000, 2001
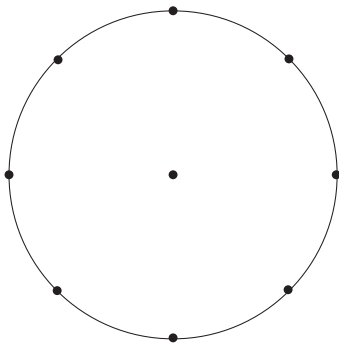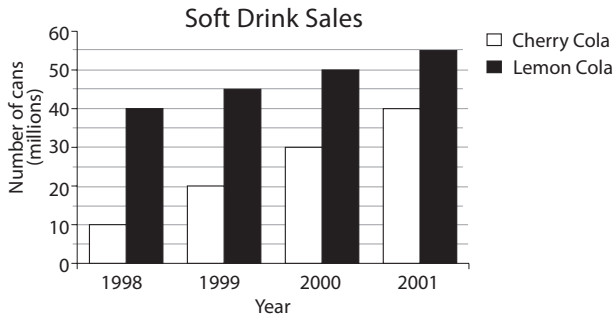
The graph shows the sales of two types of soft drink over 4 years. If the sales trends continue for the next 10 years, determine the year in which the sales of Cherry Cola will be the same as the sales of Lemon Cola.

A. 2003

B. 2004

C. 2005

D. 2006

The Real Burger Company owns 5 restaurants. The numbers of staff members employed in its 5 restaurants are: 12, 18, 19, 21, and 30 people.

A. What is the mean number of staff members in the 5 restaurants?

Answer: _____

The Real Burger Company owns 5 restaurants. The numbers of staff members employed in its 5 restaurants are: 12, 18, 19, 21, and 30 people.

B. What is the median number of staff members in the 5 restaurants?

Answer: _____

The Real Burger Company owns 5 restaurants. The numbers of staff members employed in its 5 restaurants are: 12, 18, 19, 21, and 30 people.

C. If the restaurant with 30 staff members increased its number of staff members to 50, how would this affect the median and the mean?

Over recent weeks, a shop's average sales of bottles of soda have been 50% in the regular size, 40% in the small size, and 10% in the large size. Next week, the shopkeeper will order 1,200 bottles of soda. How many of these bottles should he order in the regular size?

A.   120

B.   480

C.   600

D.   720

There are 10 red, 8 blue, and 4 white buttons in a bag. What is the chance of taking out either a blue button or a white button?

A. $\dfrac{4}{22}$

B. $\dfrac{8}{22}$

C. $\dfrac{10}{22}$

D. $\dfrac{12}{22}$

480 students were asked to name their favorite sport. The results are shown in this table.

Sport	Number of Students
Hockey	60
Football	180
Tennis	120
Basketball	120

Use the information in the table to complete and label this pie chart.

Popularity of Sports
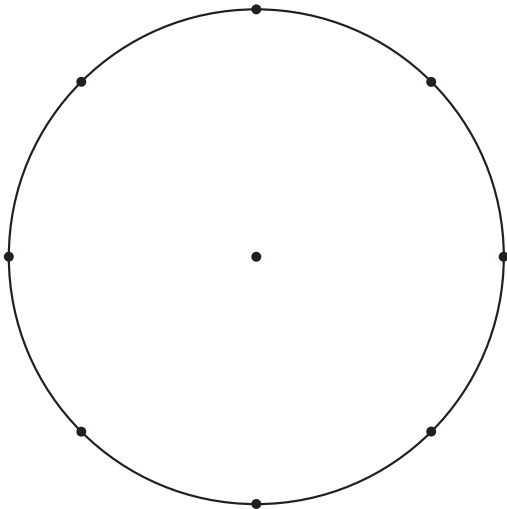
Pat and Chris were candidates for school president.

Here are the election results:

> Pat 80%
>
> Chris 20%

How likely would it be for a student asked at random to have voted for Pat?

A. It is certain that the student voted for Pat.

B. It is likely that the student voted for Pat.

C. It is unlikely that the student voted for Pat.

D. It is certain that the student did not vote for Pat.

The results of a long jump competition were reported as follows:

Average Length

Team A   3.6 m

Team B   4.8 m

There were the same number of students in each team.
Which statement about the competition MUST be true?

A. Each student in team B jumped farther than any student in team A.

B. After every student in team A jumped, there was a student in team B who jumped farther.

C. As a group, team B jumped farther than team A.

D. Some students in team A jumped farther than some students in team B.

There are 10 marbles in a bag: 5 red, and 5 blue.

Sue draws a marble from the bag at random. The marble is red.

She puts the marble back into the bag.

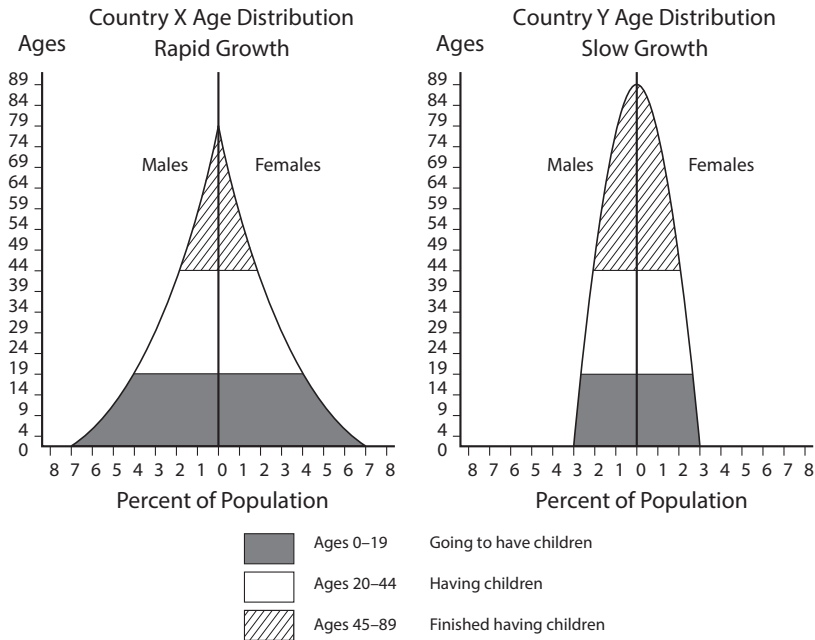What is the probability that the next marble she draws at random is red?

A. $\dfrac{1}{2}$

B. $\dfrac{4}{10}$

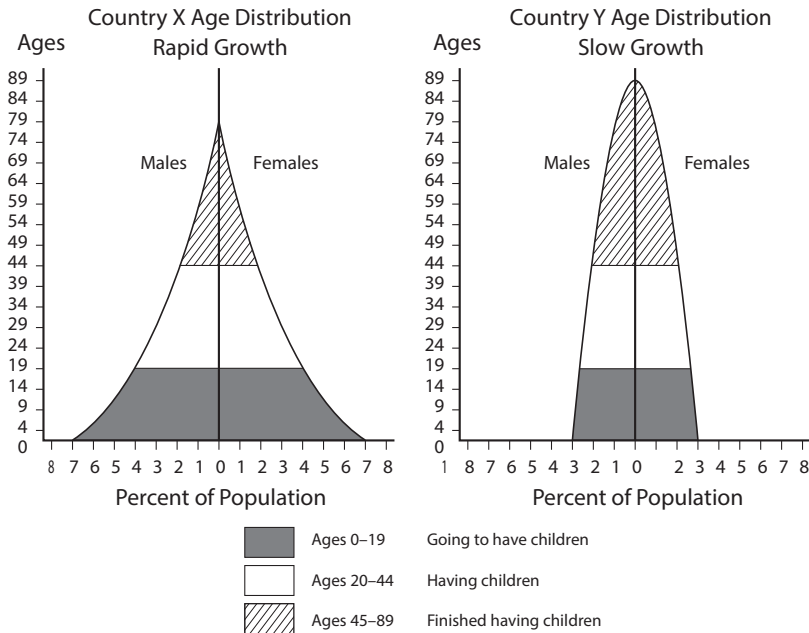C. $\dfrac{1}{5}$

D. $\dfrac{1}{10}$

Comparison of Age Structure Between Country X and Country Y

Country X Age Distribution
Rapid Growth

Country Y Age Distribution
Slow Growth

▓ (shaded)	Ages 0–19	Going to have children
□ (white)	Ages 20–44	Having children
▨ (hatched)	Ages 45–89	Finished having children

The graphs for Country X and Country Y show the age structure of each country's population. The population is divided into three age groups from youngest to oldest. The graphs enable predictions about population growth.

A. Why could the age structure of Country X lead to more rapid population growth than the age structure of Country Y?

Comparison of Age Structure Between Country X and Country Y

Country X Age Distribution
Rapid Growth

Country Y Age Distribution
Slow Growth

▓	Ages 0–19 Going to have children
☐	Ages 20–44 Having children
▨	Ages 45–89 Finished having children

The graphs for Country X and Country Y show the age structure of each country's population. The population is divided into three age groups from youngest to oldest. The graphs enable predictions about population growth.

B. Why could Country Y expect to have a bigger problem taking care of its elderly population than Country X?