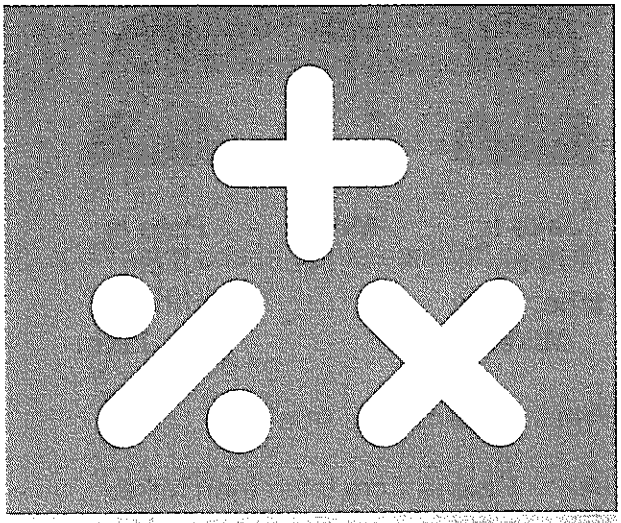
ICAS

PAPER E



2017 MATHEMATICS

DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED.

40 QUESTIONS

TIME ALLOWED: 1 HOUR

STUDENT'S NAME:

Read the instructions on the **ANSWER SHEET** and fill in your **NAME**, **SCHOOL** and **OTHER INFORMATION**.

Use a pencil. Do **NOT** use a coloured pencil or a pen.

Rub out any mistakes completely.

You **MUST** record your answers on the **ANSWER SHEET**.

Mark only **ONE** answer for each question.

Your score will be the number of correct answers.

Marks are **NOT** deducted for incorrect answers.

There are **35 MULTIPLE-CHOICE QUESTIONS** (1–35).

Use the information provided to choose the **BEST** answer from the four possible options.

On your **ANSWER SHEET** fill in the oval that matches your answer.

There are **5 FREE-RESPONSE QUESTIONS** (36–40).

Write your answer in the boxes provided on the **ANSWER SHEET** and fill in the ovals that match your answer.

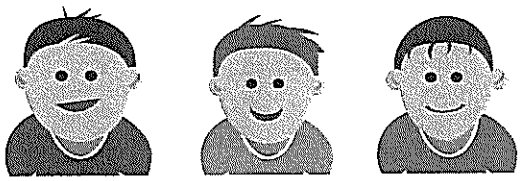
You may use a ruler and spare paper.

You are **NOT** allowed to use a calculator.

1. Which of these equals 7803?

(A) $(7 \times 100) + (8 \times 10) + (3 \times 1)$
(B) $(7 \times 1000) + (8 \times 10) + (3 \times 1)$
(C) $(7 \times 1000) + (8 \times 100) + (3 \times 1)$
(D) $(7 \times 1000) + (8 \times 100) + (3 \times 10)$

2.



Jake is 10 cm taller than Mike. **Mike** **Pete is 3 cm shorter than Jake.**

Which statement is true?

(A) Pete is 7 cm taller than Mike.
(B) Pete is 7 cm shorter than Mike.
(C) Pete is 3 cm taller than Mike.
(D) Pete is 3 cm shorter than Mike.

3. What needs to be done to 246 to get 2.46 as the answer?

(A) $\div 100$ (B) $\div 10$
(C) $\times 10$ (D) $\times 100$

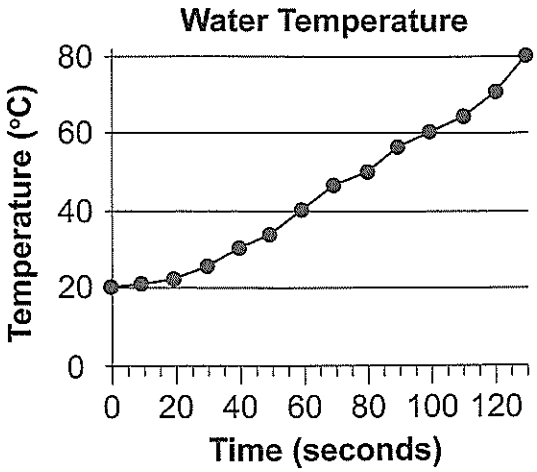
4. Sai was learning to spell words for a Spelling Bee. Each day he increased the number of words he learned by the same amount.

Day	1	2	3	4
New words	5	6	7	8

How many words had he learned to spell altogether by the end of Day 6?

(A) 19 (B) 26
(C) 35 (D) 45

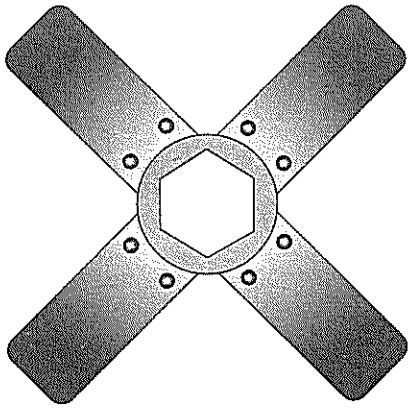
5. Kim measured the temperature of a pot of water as it was being heated and plotted her results.



How often did Kim measure the temperature of the water?

(A) every 5 seconds
(B) every 10 seconds
(C) every 14 seconds
(D) every 20 seconds

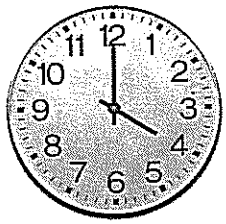
6. This ceiling fan has a hexagonal light at its centre.



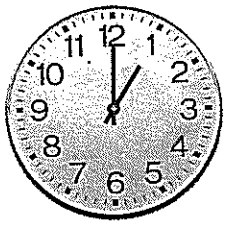
How many lines of symmetry are there in this combined ceiling fan and light?

(A) 2
(B) 4
(C) 6
(D) 8

7. Jason noticed these clocks at the airport showing local times for the same day.



London
am



Sydney
pm

What is the time difference between London and Sydney?

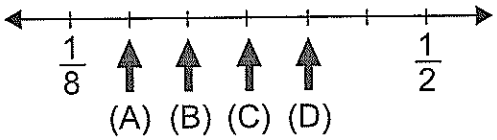
(A) 3 hours
(B) 7 hours
(C) 9 hours
(D) 15 hours

8. The picture shows a 12-sided coin.

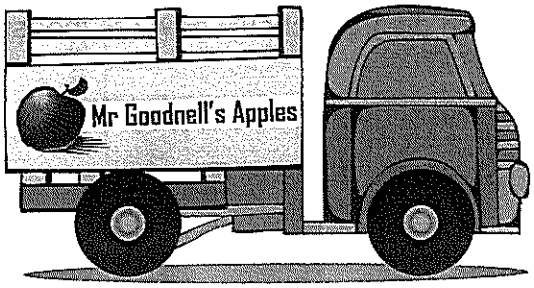
How many pairs of parallel sides are there?

(A) 3
(B) 4
(C) 6
(D) 12

9. Which arrow points to $\frac{1}{4}$ on this number line?



10. Mr Goodnell's truck holds 0.5 tonnes of apples. He delivers to twelve shops.

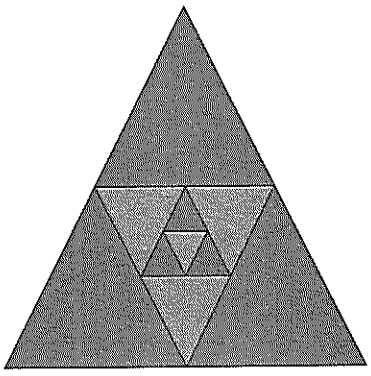


Each shop has 37 kg of apples delivered to it.

What mass of apples are left over after the last delivery?

(A) 56 kg
(B) 66 kg
(C) 130 kg
(D) 463 kg

11.



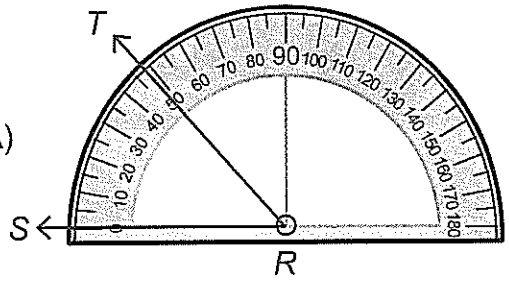
How many of the smallest triangles can fit inside the largest triangle?

(A) 28
(B) 36
(C) 48
(D) 64

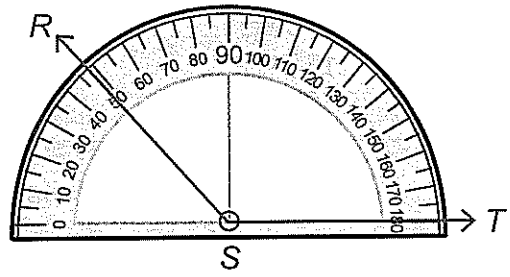
12. Lei correctly used her protractor to measure $\angle RST$ as 48°.

Which diagram shows how Lei measured $\angle RST$?

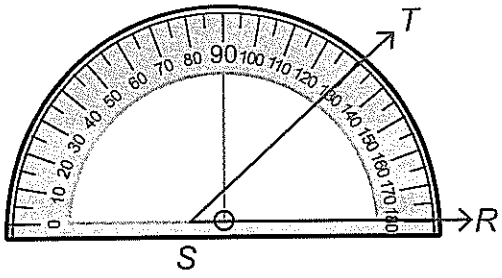
(A)



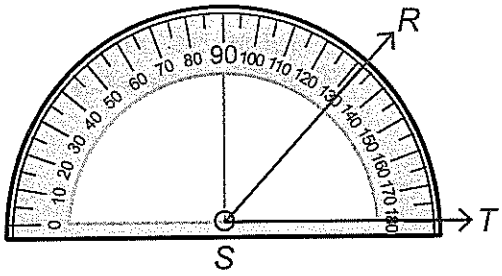
(B)



(C)



(D)



13. A company owns a fleet of 100 cars. Each car is either black or white.

There are 35 black cars.

A car is picked at random from the fleet.

What is the probability that it is white?

(A) 0.35 (B) 0.65

(C) $\frac{1}{35}$ (D) $\frac{1}{65}$

14. Fadi wrote the first four terms of a number pattern involving fractions.

1	2	3	4
$1+\frac{1}{2}$	$1+\frac{1}{2+\frac{1}{3}}$	?	$1+\frac{1}{2+\frac{1}{3+\frac{1}{4+\frac{1}{5}}}}$

What expression could ? be?

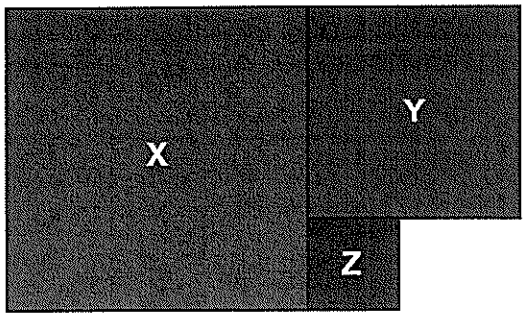
(A) $1+\dfrac{1}{2+\frac{1}{3}+\frac{1}{4}}$

(B) $1+\dfrac{1}{2+\dfrac{1}{3+\frac{1}{4}}}$

(C) $1+\dfrac{1}{2+\dfrac{1}{3+4}}$

(D) $1+\dfrac{1}{2+\dfrac{1}{\frac{3+1}{4}}}$

15. X, Y and Z are squares. The perimeter of X is 32 m and the area of Y is 25 m^2.



NOT TO SCALE

What is the perimeter of Z?

(A) 3 m
(B) 7 m
(C) 9 m
(D) 12 m

16. Samantha bought $1\frac{1}{4}$ kg of apricots.

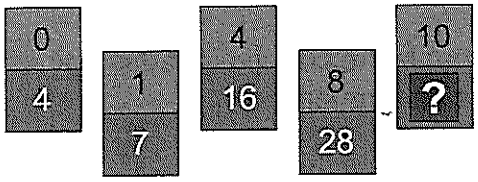
She gave her brother two-fifths of these.

What mass of apricots did Samantha have left?

(A) $\frac{1}{2}$ kg (B) $\frac{3}{5}$ kg

(C) $\frac{3}{4}$ kg (D) $1\frac{3}{20}$ kg

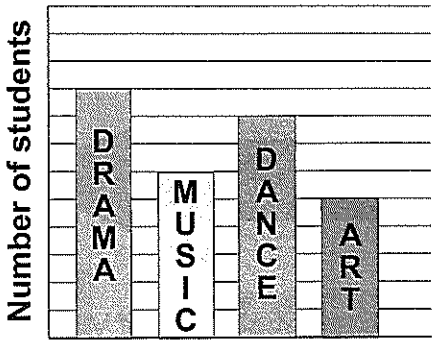
17. The same rule is applied to the top number in each rectangle to give the bottom number.



What number must ? be?

(A) 30 (B) 32
(C) 34 (D) 40

18. Ingrid drew a column graph to show some after-hours activities at school.

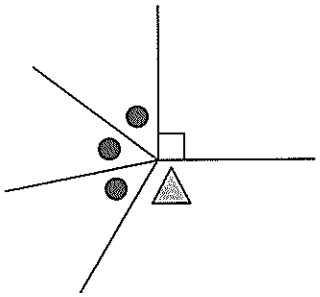


Eight more students study drama than study art.

How many students study music?

(A) 5
(B) 6
(C) 10
(D) 12

19. In this diagram, ● + ● = △.



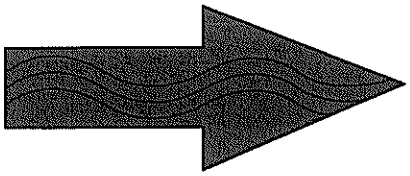
NOT TO SCALE

What angle is represented by △?

(A) 72° (B) 100°
(C) 108° (D) 120°

20. Vijay read that the angle sum of a triangle is 180°.

He joined a rectangle and a triangle to draw this arrow.



What is the angle sum of Vijay's arrow?

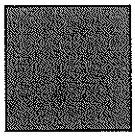
(A) 900° (B) 720°
(C) 540° (D) 360°

21. All 106 students at a school camp must sleep in tents. Each tent is occupied by either 9 or 11 students.

How many tents are occupied by 11 students?

(A) 2 (B) 8
(C) 9 (D) 10

22. Isha had a paper square.

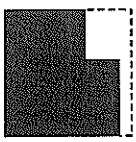


She cut a piece out of the square and made a new shape that had the same perimeter as her original square.

Which one of these could be Isha's new shape?

(A)

(B)



(C)

(D)

23. Mr Li wrote this number sentence.

$14 - 12 \div 2 + \boxed{?} \div 5 = 11$

What must the value of ? be?

(A) 54
(B) 50
(C) 47
(D) 15

24. Jia works at the market on the 3rd Sunday of every second month.

The last day she worked was on Sunday 20 May.

When will Jia next work at the market?

(A) Sunday 15 July
(B) Sunday 16 July
(C) Sunday 21 July
(D) Sunday 22 July

25. The owner of a shoe store did an annual stock count. He counted 200 pairs of sports shoes.

Sports shoes	
Shoe size	**Number of pairs**
7	20
8	40
9	65
10	50
11	25

The owner selected one of these pairs of sports shoes at random.

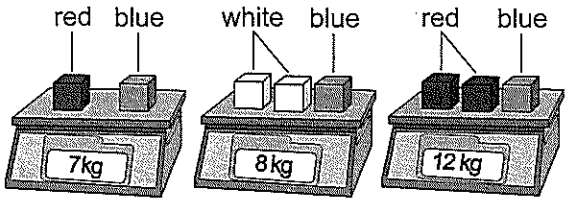
What is the chance that this pair of shoes is size 9 or larger?

(A) 30%
(B) 40%
(C) 70%
(D) 90%

26. Manu has some cubes in three different colours.

Cubes of the same colour have the same mass.

She weighs the cubes.



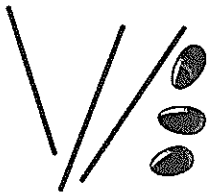
What is the mass of one white cube, in kilograms?

(A) 1.5
(B) 2
(C) 2.5
(D) 3

27. Jim is using pebbles and sticks to represent whole numbers.

- Each stick has the same positive value.
- The value of a pebble is greater than the value of a stick.
- Each pebble has the same value.

This combination represents the number 21.

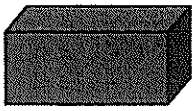


Jim made this combination.

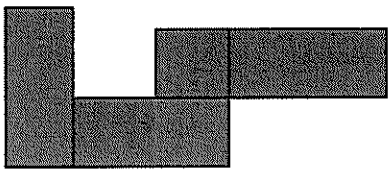
Which of these numbers could this combination represent?

(A) 7 (B) 9
(C) 11 (D) 13

28. John had four identical square prisms.

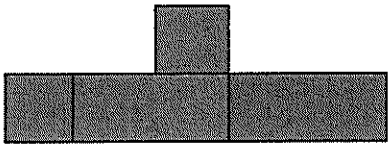


He arranged them so that the prisms looked like this from above.

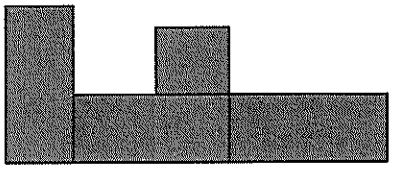


Which of these is the view from the front?

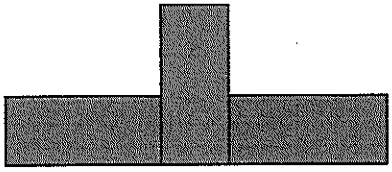
(A)



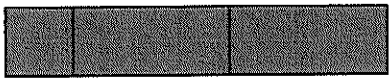
(B)



(C)



(D)



29. Sarah is making jelly for 8 people using this recipe.

Strawberry Jelly for 4 People

Ingredients

- 425 mL apple juice
- 140 g frozen strawberries
- 1 tablespoon gelatine

Sarah has only a tablespoon and a $\frac{1}{2}$ cup to measure the apple juice.

She uses this table as a guide.

Liquid Measures

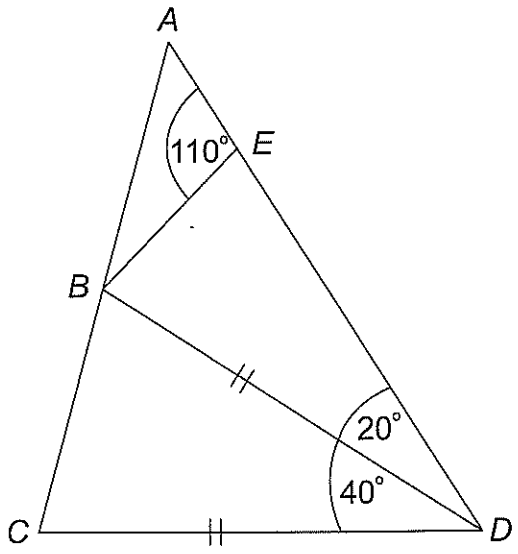
1 tablespoon = 20 mL

1 cup = 250 mL

Which combination will be closest to the amount of apple juice needed to make the jelly for 8 people?

	Number of $\frac{1}{2}$ cups	Number of tablespoons
(A)	3	3
(B)	3	5
(C)	6	3
(D)	6	5

30. In the diagram below $BD = CD$.



NOT TO SCALE

Nilesh calculated each of the angles in this diagram.

How many 70° angles should he find?

(A) 1
(B) 2
(C) 3
(D) 4

31. Only square numbers have an odd number of factors.

For example, 16 has five factors; 1, 2, 4, 8 and 16.

How many numbers between 1 and 100 have exactly three factors?

(A) 4
(B) 5
(C) 6
(D) 7

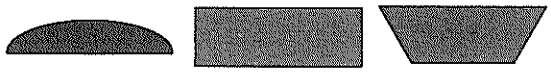
32. Oscar, Lily and Jack collect souvenir coins.

Oscar has 44 more coins than Lily and 48 more coins than Jack. Oscar has 6 more coins than Lily and Jack combined.

How many coins do Oscar, Lily and Jack have altogether?

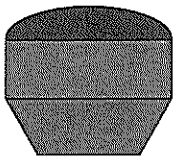
(A) 196
(B) 166
(C) 156
(D) 146

33. Sam had identical copies of these three paper shapes.



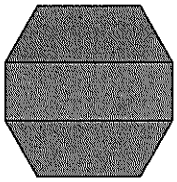
He used them to create these designs.

Design 1



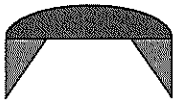
Area = 17 cm^2

Design 2



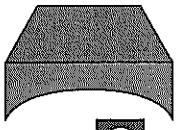
Area = 20 cm^2

Design 3



Area = 5 cm^2

Design 4

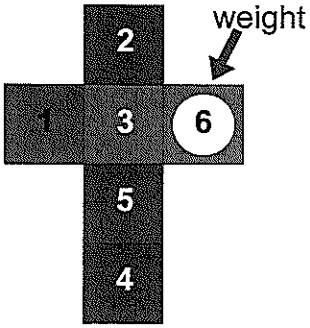


Area = ? cm^2

What value must ? be?

(A) 10
(B) 11
(C) 12
(D) 13

34. Kim made this net. She put a weight on the '6' and then folded it to make a dice.



On her first trial, Kim rolled this dice 240 times and recorded her results.

Outcome	Frequency
1	72
2	36
3	40
4	35
5	33
6	24
Total	240

Kim then moved the weight to the opposite face.

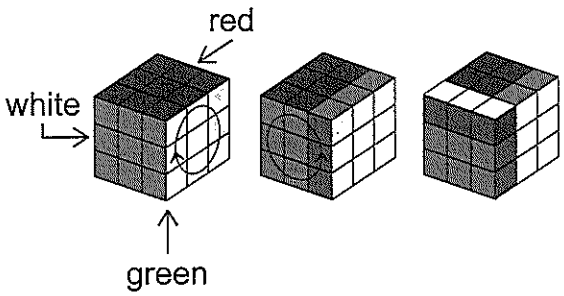
She rolled her re-weighted dice 200 times.

Based on her trial, how many sixes should Kim expect this time?

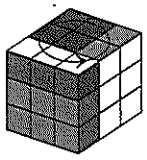
(A) 20
(B) 33
(C) 60
(D) 72

35. A Rubik's cube® has a different colour on each of its six faces when new.

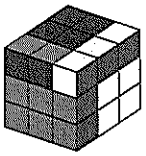
Dedi rearranged a new cube for his friend to solve. He rotated two layers, one at a time, a quarter turn as shown.

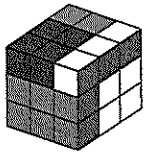


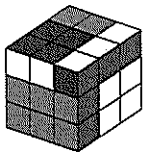
He then rotated the top layer a quarter turn.

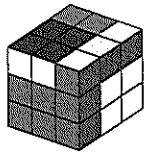


Which of these could be Dedi's cube?


(A)


(B)


(C)


(D)

QUESTIONS 36 TO 40 ARE FREE RESPONSE.
Write your answer in the boxes provided on the ANSWER SHEET and fill in the ovals that match your answer.

36. Minh received a 25% discount on the advertised price of a concert ticket.

A booking fee of $4 was added to this discounted price.

Minh paid a total of $100.

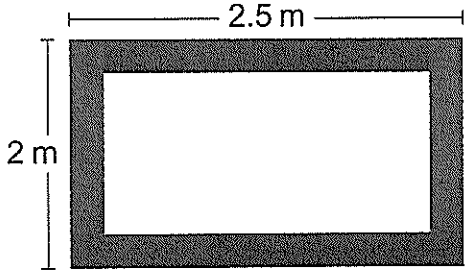
What was the advertised price of the concert ticket, in dollars?

37. Xiang chose a positive whole number. She squared it, added 5 and then divided the answer by 3. Her result was 58.

What number did Xiang choose?

38. Arun's bathroom is 2.5 m by 2 m. He tiled the floor with square tiles, all of side length 10 cm.

Arun placed a single row of stone tiles around the edge of the floor. He covered the rest of the floor with white tiles as shown.

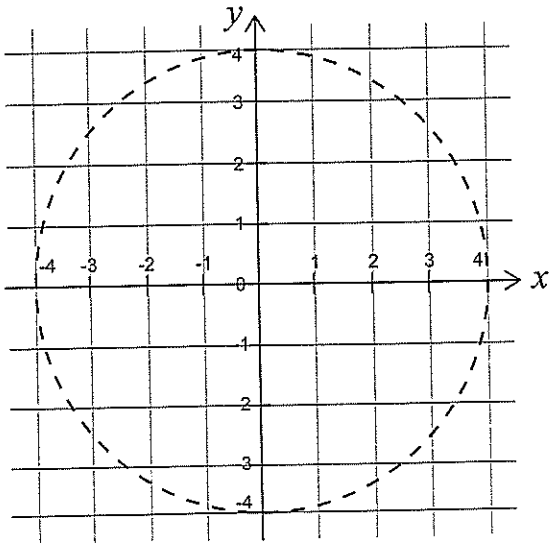


NOT TO SCALE

How many white tiles did Arun use?

39. Emma wants to plot every point on the number plane where each of these conditions is true of the point:

- the coordinates are integers
- it is less than 4 units from the origin
- the sum of the coordinates is even or zero.



How many points should Emma plot on the number plane?

40. Gina wrote down a number between 99 and 999. She noticed that the product of the hundreds digit and the units digit was equal to the tens digit.

How many numbers between 99 and 999 have this property?