

CAT4 Level F practice questions

CAT4 is a reasoning test made by GL Assessment, and Level F is its version for Years 9 and 10, and Grades 8 and 9. For each of its eight types of question, here is a worked example, which is already answered and explained, then a question for your child to try. The questions are free on cat4practice.com/cat4-level-f, where your child can also do them on screen.

How to use it

1. Read each worked example together. Its answer and explanation are right under it.
2. Then your child tries the next question without help, and circles one letter.
3. When all eight are done, check the answers at the back. Then read the explanations together, starting with any question your child got wrong.

The answers start on a new page, headed "Answer key", so your child does not see them by accident. To print without them, stop before that page.

What your child needs: a pencil and an eraser, and rough paper (spare paper for doing sums) for the two number tests, number analogies and number series. In the real test, children get rough paper for these two tests too.

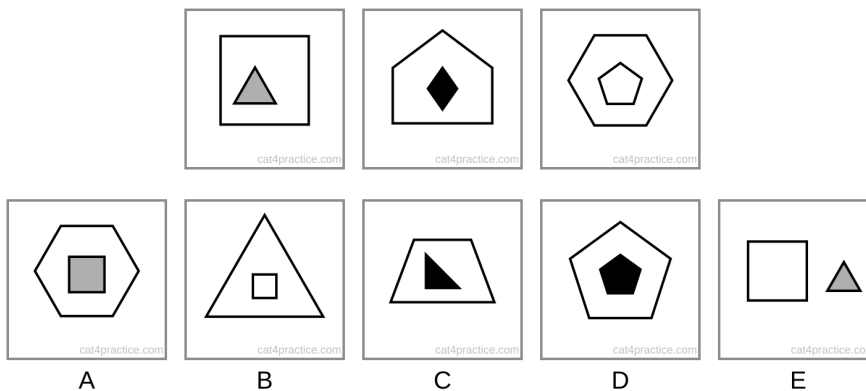
In the real test, each of the eight tests has a time limit. By our estimate, that leaves about 20 to 30 seconds for each question. For these questions, use no clock.

We wrote these questions ourselves, to match GL's description of each type. They are not GL's questions, and GL does not recommend any practice materials, including these. A result here is not a CAT4 score.

Figure classification

Look at the three figures (images) at the top. They are alike in some way. Which answer goes with them?

Worked example



C. In each figure a small shape sits inside a bigger one, and the small shape has one side fewer: a triangle (3 sides) inside a square (4); a diamond (4) inside a five-sided house shape (a pentagon too); a pentagon (5) inside a hexagon (6). The colour of the small shape keeps changing, so it does not matter. In C a triangle (3 sides) sits inside a four-sided shape (a trapezium).

- **A:** A has a square (4 sides) inside a hexagon (6 sides): two sides fewer, not one.
- **B:** B has a square (4 sides) inside a triangle (3 sides): the small shape has one side more, not one fewer.
- **D:** D has a pentagon (5 sides) inside a pentagon: the same number of sides.
- **E:** In E the triangle has one side fewer than the square, but it is beside the square, not inside it. In every figure at the top the small shape is inside.

Next time: When each figure has two parts, compare the parts with each other: count the sides of both, and say how the counts are linked.

Question 1

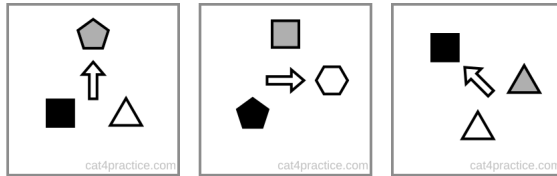
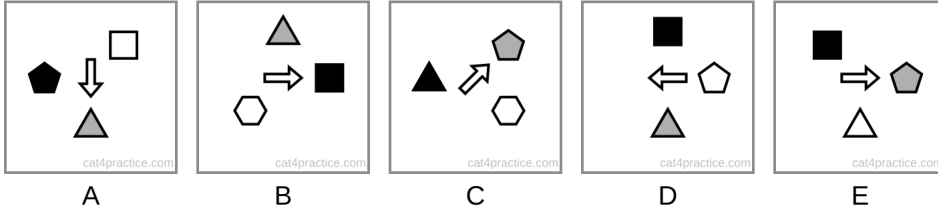
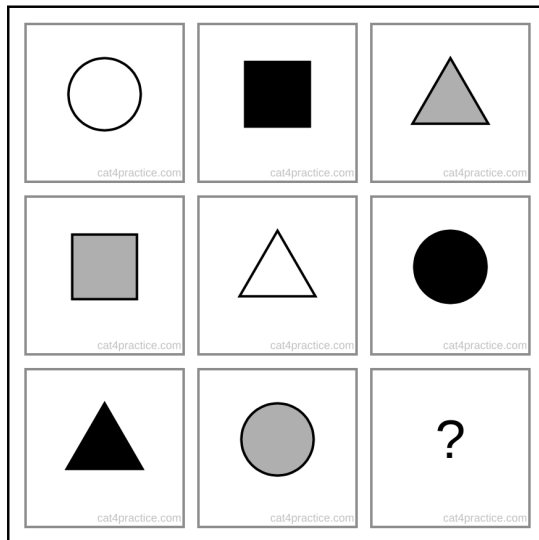
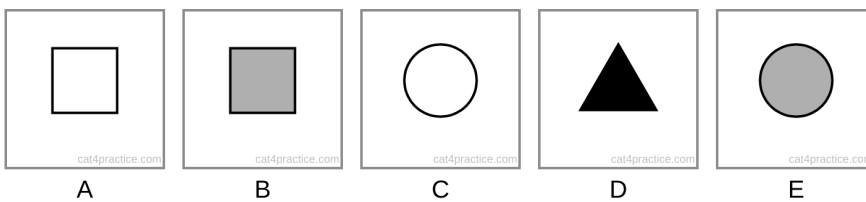


Figure matrices

Which answer goes in the box with the question mark? Look for a pattern across each row (left to right) and down each column (top to bottom).

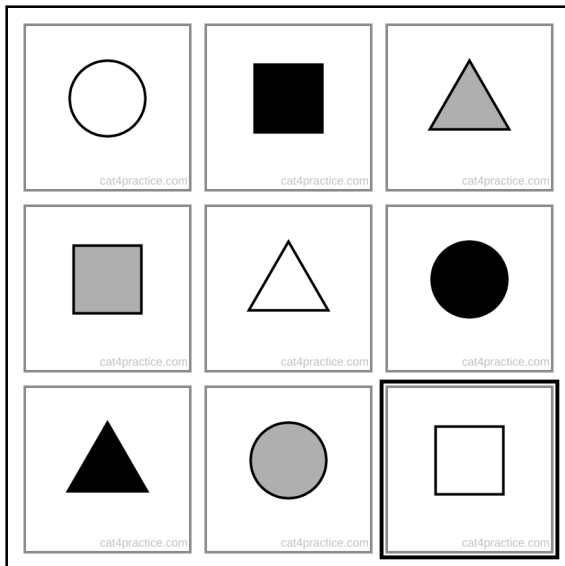
Worked example



A. Look along each row: it has one circle, one square and one triangle, and one white, one grey and one black shape. The bottom row already has a black triangle and a grey circle, so it is missing a square, and the missing colour is white. Check down the last column too: it has a grey triangle and a black circle, so it also needs a white square: A.

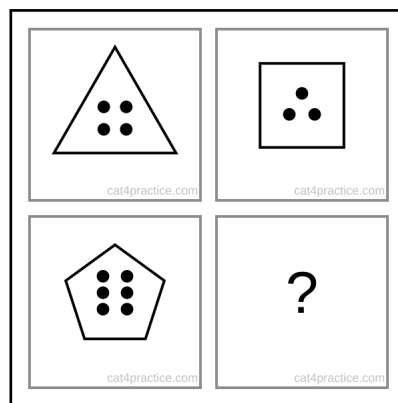
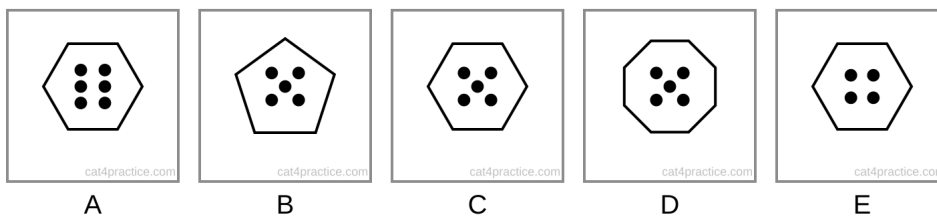
- **B:** B is a square, but grey: the bottom row already has a grey shape.
- **C:** C is white, but a circle: the bottom row already has a circle.
- **D:** D is a black triangle: the bottom row already has both a triangle and a black shape.
- **E:** E is a grey circle: a copy of a shape already in the bottom row.

Next time: In a nine-box square, check whether each row holds one of each kind. Then the missing box is whatever kind is not yet in its row, and the column should agree.



Which answer goes in the box with the question mark? The top two images show a change. Make the same change to the image on the left of the question mark.

Question 2



Verbal classification

The three words in bold (dark letters) are alike in some way. Which answer is another one of the same kind? The answer is not the name for the whole group. For example, for pear, plum and mango, the answer would be another fruit, not the word "fruit".

Worked example

huge **enormous** **vast**

A size B tiny C immense D elephant E expand

C. Huge, enormous and vast all describe something very big. Immense does too: it means very big.

- A: "Size" is what the words are about, but it is a name (a noun), not a word that describes something. You can say "a vast ocean", but not "a size ocean".
- B: Tiny describes size too, but it means very small: the opposite.
- D: An elephant is huge, but "elephant" names an animal. It does not describe anything.
- E: "Expand" means to get bigger. It is something that happens (a verb), not a word that describes how big something is.

Next time: Put a word in bold into a short phrase, such as "the huge ocean". Then put each answer in its place. The right answer fits, and the phrase still means the same: "the immense ocean".

Question 3

however **although** **yet**

A because B therefore C whereas D contrast E also

Verbal analogies

The first two words are linked in some way. Which answer is linked to the third word in the same way?

Worked example

damp → **soaked** : **warm** →

A dry B sun C scorching D cool E temperature

C. Soaked is very wet: much wetter than damp. In the same way, scorching is very hot: much hotter than warm.

- A: Dry is the opposite of damp. It goes with the first word, not with "warm", and it is an opposite, not "much more".
- B: The sun makes things warm, but the sun is a thing, not a word for being hotter.
- D: Cool is the opposite of warm. The pair goes from a little to a lot of the same thing, not to its opposite.
- E: Temperature is what "warm" tells you about, not a word for being very hot.

Next time: Make a sentence for the pair: "soaked is much wetter than damp". Then use the same sentence for the third word: "___ is much hotter than warm".

Question 4

germ → **disease** : **spark** →

A electricity B match C bright D fire E metal

Number analogies

In each pair, the second number is made from the first in the same way. Which answer completes the last pair?

Worked example

[4 → 19] [7 → 31] [5 → ?]

A 20 B 23 C 24 D 29 E 31

B.

1. Compare the first two pairs. The first numbers, 4 and 7, are 3 apart. The second numbers, 19 and 31, are 12 apart.
2. $12 \div 3 = 4$: each time the first number goes up by 1, the second number goes up by 4. Multiplying by 4 does that ($4 \times 4 = 16$ and $7 \times 4 = 28$ are 12 apart too), so the rule multiplies by 4.
3. Then find what else the rule does: $4 \times 4 = 16$, and 19 is 3 more than 16. So the rule is: multiply by 4, then add 3.
4. Check it on the second pair: $7 \times 4 = 28$, and $28 + 3 = 31$.
5. Use it on 5: $5 \times 4 = 20$, and $20 + 3 = 23$: B.
 - **A:** 20 is 5×4 . It does the first step and forgets the second: add 3.
 - **C:** 24 is $5 \times 5 - 1$. The rule " $\times 5$, then $- 1$ " works for the first pair ($4 \times 5 - 1 = 19$), but not for the second: $7 \times 5 - 1 = 34$, not 31.
 - **D:** 29 is $5 + 24$. Adding 24 works for the second pair ($7 + 24 = 31$), but not for the first: $4 + 24 = 28$, not 19.
 - **E:** 31 is copied from the second pair. It does not come from 5.

Next time: When adding the same number does not fit both pairs, compare them: divide how far apart the second numbers are by how far apart the first numbers are. That is the number to multiply by.

Question 5

[9 → 5] [21 → 9] [33 → ?]

A 17 B 13 C 11 D 29 E 21

Number series

These numbers are a series: they follow a rule. Which number comes next?

Worked example

5 7 11 17 25 →

A 27 B 33 C 35 D 37 E 50

C. Write the jump from each number to the next: + 2, + 4, + 6, + 8. The jumps are not the same, but they grow by 2 each time. So the next jump is + 10, and the next number is $25 + 10 = 35$.

- **A:** 27 is $25 + 2$: it starts the jumps again from + 2. The jumps keep growing.
- **B:** 33 is $25 + 8$: it repeats the last jump. Each jump is 2 more than the one before.
- **D:** 37 is $25 + 12$: the jump grows by 4 here, not by 2.
- **E:** 50 is 25×2 . The numbers are not doubling: $5 \times 2 = 10$, not 7.

Next time: If the jumps are not all the same, write them in a row under the numbers and look for a rule in the jumps.

Question 6

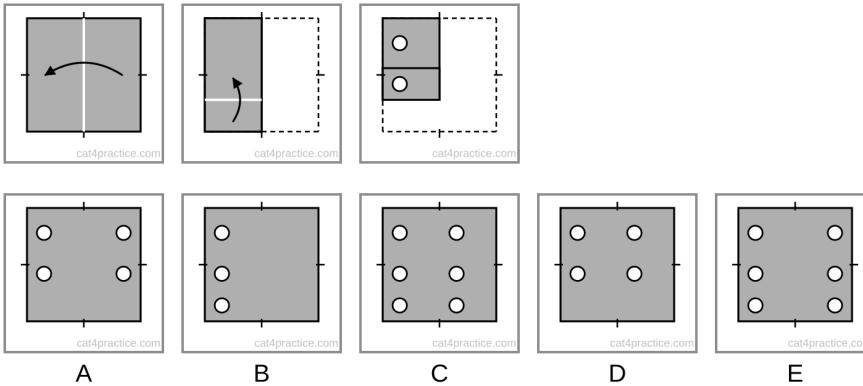
1 5 13 29 61 →

A 64 B 93 C 122 D 125 E 183

Figure analysis

A square of paper is folded. Then one or more holes are punched through the folded paper, through every layer. Which answer shows the paper when it is unfolded?

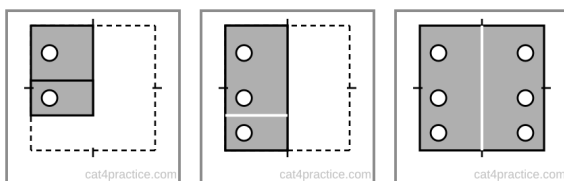
Worked example



E.

1. Count the layers under each hole. The lower hole goes through the strip (the bottom part, folded up) too: 4 layers, so 4 holes. The upper hole is above the strip: 2 layers, so 2 holes.
 2. Unfold the strip: the hole in the strip comes down with it, to below the strip's fold line, as far below that line as the lower hole is above it.
 3. Unfold the first fold, the fold in half down the middle: every hole gets a matching hole in the right half, as far from the middle as the hole is.
 4. That makes 6 holes, each pair the same distance from the middle line: E. C has 6 holes too, but they are not mirrored.
- **A:** A forgets the strip: the lower hole needs a matching hole in the strip.
 - **B:** B forgets the fold in half: the right half needs holes too.
 - **C:** C copies the holes into the right half without flipping them, so they are too near the middle of the paper. A fold makes a mirror image.
 - **D:** D copies the holes into the right half without flipping them, and forgets the strip.

Next time: Before you unfold, count the layers under each hole. A fold that covers only part of the paper adds layers only there.



Question 7

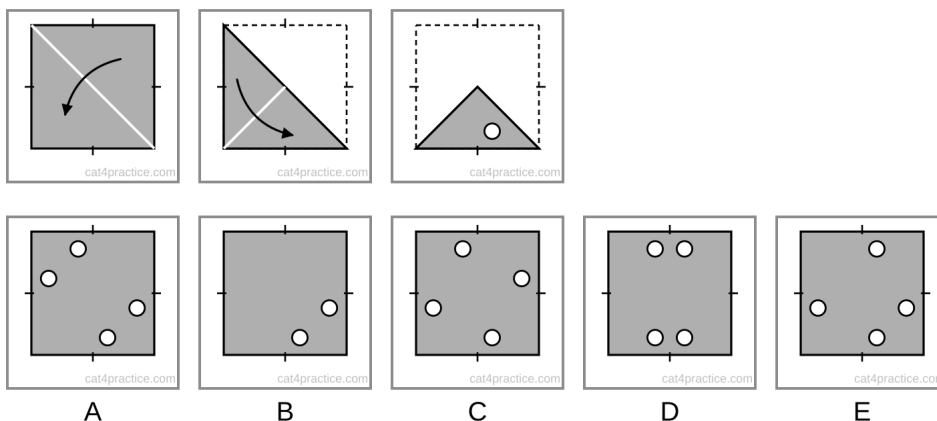
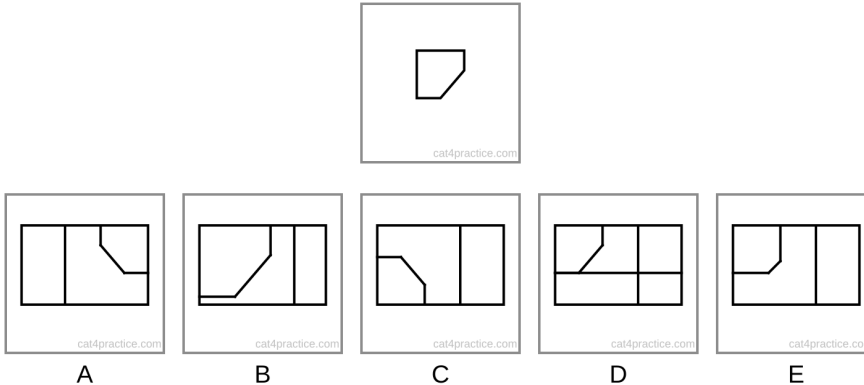


Figure recognition

Which image hides the shape at the top? It is the same size and faces the same way: not turned round, and not a mirror image. Each of its sides is drawn in that image, as a whole line or as part of a longer line. (In the real test, the shape is drawn below the five images.)

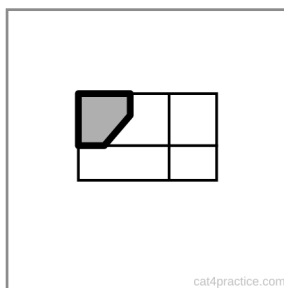
Worked example



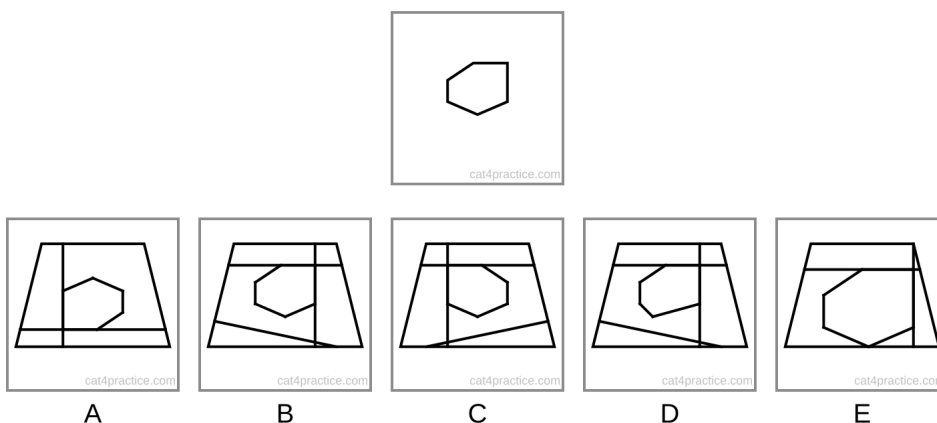
D. The shape is in the top left of D. Its top and left sides are parts of the edges of the black rectangle; the short line going down from the top, the sloping line and the line across make the rest. Like the shape at the top, its cut-off corner is at the bottom right, and the cut is a long one.

- **A:** A has the shape as a mirror image: its cut-off corner is at the bottom left.
- **B:** B has the same shape, but bigger: about one and a half times as wide and as tall.
- **C:** C has the shape as a mirror image from top to bottom (like a reflection in water): its cut-off corner is at the top right.
- **E:** E has a shape whose cut-off corner is much smaller: its sloping side is short.

Next time: Find the most unusual side of the shape first (here, the sloping cut). Look for a line in each image that slopes the same way and is the same length, then check the other sides.



Question 8



Answer key

Question	Type	Answer
1	Figure classification	E
2	Figure matrices	C
3	Verbal classification	C
4	Verbal analogies	D
5	Number analogies	B
6	Number series	D
7	Figure analysis	A
8	Figure recognition	B

Answers explained

Question 1

E. Each figure has a white arrow with three small shapes around it, and the arrow points at the shape with the most sides. In the first figure it points at the pentagon (5 sides), not the triangle (3 sides) or the square (4 sides). In the second it points at the hexagon (6 sides), not the square or the pentagon. In the third it points at the square (4 sides), not the two triangles. The colours do not matter. In E the arrow points right, at the pentagon: the pentagon has more sides than the square and the triangle.

- **A:** In A the arrow points at the triangle: the shape with the fewest sides.
- **B:** In B the arrow points at the square (4 sides), but the hexagon has 6.
- **C:** In C the arrow points at the pentagon (5 sides), but the hexagon has 6.
- **D:** In D the arrow points left, at nothing. The pentagon is on the right, at the back end of the arrow: the arrow points away from it.

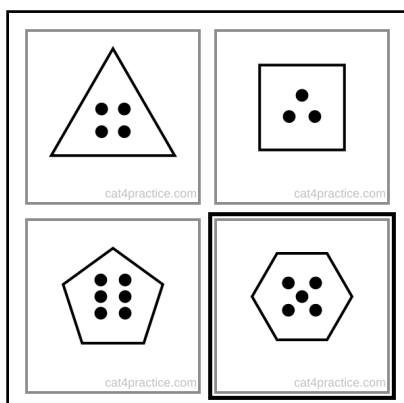
Next time: When a figure has an arrow, ask what it points at, then ask what is special about that shape compared with the others in the same figure.

Question 2

C. Two things change in the top row, in opposite directions: the shape gets one more side (a triangle, 3 sides, becomes a square, 4 sides), and there is one dot fewer (4 dots become 3). Make both changes to the pentagon (5 sides) with 6 dots: a shape with 6 sides, a hexagon, with 5 dots: C.

- **A:** A is a hexagon, but it still has 6 dots: one dot should go.
- **B:** B has 5 dots, but it is still a pentagon: it has not gained a side.
- **D:** D has 5 dots, but 8 sides: three more sides, not one.
- **E:** E is a hexagon with 4 dots: two dots have gone, not one.

Next time: Count everything in the top row before and after: here one count goes up by 1 and the other goes down by 1.



Question 3

C. However, although and yet are all linking words that show a contrast: they join two ideas that are different, or that go against what you expect. "It was raining, yet we went out." Whereas shows a contrast too: "I like tea, whereas my brother likes coffee."

- **A:** "Because" is a linking word, but it gives a reason, not a contrast.
- **B:** "Therefore" is a linking word, but it shows a result: "It was raining. Therefore we stayed in."
- **D:** "Contrast" is the name for what each of them does, not one more of them. The answer must be one more linking word that shows a contrast.
- **E:** "Also" is a linking word, but it adds something of the same kind. It does not show a contrast.

Next time: For small linking words, ask how each one links the two parts of a sentence: does it give a reason, a result, more of the same, or something different?

Question 4

D. A germ can cause a disease: it is the small thing that starts it. A spark can cause a fire: the small thing that starts it.

- **A:** Electricity can make a spark, so electricity is the cause and the spark is what it causes. The answer must be what the spark causes, not what causes the spark.
- **B:** Striking a match makes a spark and a flame. The match comes before the spark; it is not what the spark causes.
- **C:** A spark is bright, but "bright" describes the spark. It is not something the spark causes.
- **E:** Sparks can fly off metal, but metal is not something a spark causes.

Next time: Make a sentence for the pair: "a germ causes a disease". Then try "a spark causes ____": the answer is what the third word causes, not what causes it.

Question 5

B. Two steps: add 6, then divide by 3. $9 + 6 = 15$, and $15 \div 3 = 5$. $21 + 6 = 27$, and $27 \div 3 = 9$. So $33 + 6 = 39$, and $39 \div 3 = 13$. The same rule can also be written with the steps the other way round, but then the number changes: divide by 3, then add 2 (adding 6 before $\div 3$ is the same as adding $6 \div 3 = 2$ after). Check: $9 \div 3 + 2 = 5$, and $21 \div 3 + 2 = 9$. Both rules give 13: $33 \div 3 + 2 = 13$.

- **A:** 17 is $33 \div 3 + 6$: it swaps the two steps but still adds 6. Check on the first pair: $9 \div 3 + 6 = 9$, not 5. Dividing first works only if you then add 2.
- **C:** 11 is $33 \div 3$: it does only one of the two steps. Check on the first pair: $9 \div 3 = 3$, not 5.
- **D:** 29 is $33 - 4$. Taking away 4 works for the first pair ($9 - 4 = 5$), but not for the second: $21 - 4 = 17$, not 9.
- **E:** 21 is $33 - 12$. Taking away 12 works for the second pair ($21 - 12 = 9$), but not for the first: $9 - 12$ is below zero, not 5.

Next time: With two steps, check your rule on both pairs before you choose. If you swap the steps, the number you add changes: add 6, then $\div 3$ is the same rule as $\div 3$, then add 2.

Question 6

D. Each number is double the one before, plus 3: $1 \times 2 + 3 = 5$, $5 \times 2 + 3 = 13$, $13 \times 2 + 3 = 29$, $29 \times 2 + 3 = 61$. So the next number is $61 \times 2 + 3 = 125$. (The jumps show it too: + 4, + 8, + 16, + 32 double each time, so the next jump is + 64, and $61 + 64 = 125$.)

- **A:** 64 is the next jump (the amount added), not the next number. Add it to 61: $61 + 64 = 125$.
- **B:** 93 is $61 + 32$: it repeats the last jump. The jumps double each time.
- **C:** 122 is 61×2 . It doubles but forgets to add 3.
- **E:** 183 is 61×3 . The numbers are not multiplied by 3: $5 \times 3 = 15$, not 13.

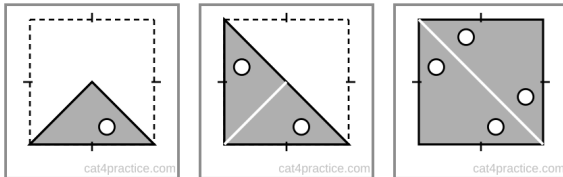
Next time: When the numbers grow faster and faster, try "double it, then add or take away a small number" on the first few.

Question 7

A. Layers: two folds, so 4 layers: 4 holes. Unfold the second fold: the hole gets a matching hole across that fold line, near the left edge. Unfold the first fold: both holes get a matching hole across the first fold line. The holes make two pairs, one in the bottom right quarter and one in the top left quarter: A.

- **B:** B forgets the second fold: only 2 holes.
- **C:** C turns the hole round the middle of the square, a quarter turn at a time, instead of flipping it. Here the holes come in two pairs, one pair in each of two opposite quarters.
- **D:** D flips the holes across a line straight down the middle and a line straight across the middle, but both fold lines slope: the first runs from corner to corner, the second from a corner to the middle of the square.
- **E:** E flips the hole across a line straight across the middle for the second fold, but that fold line slopes, like the first one: it runs from a corner to the middle of the square.

Next time: A fold makes a mirror image, not a turned copy. Flip the holes across one fold line at a time, last fold first.



Question 8

B. The six-sided shape is in the middle of B. Its flat top is part of the line across just below the top edge of the black trapezium. That line goes all the way across, to the sloping left and right sides of the trapezium. Its upright right side is part of the long upright line. Its other four sides are short sloping and upright lines. Its bottom point is in the middle, halfway between its left and right sides, as in the shape at the top.

- **A:** A has the shape turned half way round: its bottom point is at the top.
- **C:** C has the shape as a mirror image: its long upright side is on the left.
- **D:** D has a shape whose bottom point is much further left, only a quarter of the way across.
- **E:** E has the same shape, but bigger: about one and a half times as wide and as tall.

Next time: With six sides, check the corners in order round the shape. A near copy usually has one corner in a different place.

