NSW Selective High School Placement Test

Mathematical Reasoning — Practice Paper

Questions: 35

Time allowed: 40 minutes

Calculator: not permitted

Instructions: Each question has five answer choices (A, B, C, D, E). Choose the one best answer.

Paper ID: seed-50016

Figures are drawn for clarity; where a figure is marked “not to scale”, work from the labelled values.

1. A movie finishes at 12:35 (24-hour time). It ran for 5 hours 15 minutes. What time did it start (give your answer in 12-hour format)?

(A) 7:20 am

(B) 5:50 pm

(C) 7:35 am

(D) 7:30 am

(E) 7:20 pm

2. Mrs Rossi is tiling a border of two rows along the bottom of a wall. Both rows start at the same corner. The top row uses only tiles 35 cm long and the bottom row uses only tiles 20 cm long, laid end to end with no gaps. Mrs Rossi wants both rows to end at exactly the same point, and the border to be as short as possible. How many tiles are needed altogether?

(A) 8

(B) 14

(C) 4

(D) 55

(E) 11

3. How many three-digit whole numbers can be divided exactly by both 9 and 8?

(A) 11

(B) 112

(C) 13

(D) 100

(E) 12

4. A square field has sides that are a 4-digit whole number of metres long. Its area in square metres is the side length multiplied by itself. What is the greatest number of digits the area could have?

(A) 8

(B) 7

(C) 16

(D) 5

(E) 9

5. Aisha has $75 in a money box. In week 1 she puts in $35, in week 2 she takes out some money, and she keeps taking turns: putting in $35 one week, then taking out the same amount as before the next week. At the end of week 7 there is $167 in the money box. How much does she take out each time?

(A) $12

(B) $48

(C) $24

(D) $19

(E) $16

6. Five runners recorded the following times in a 100-metre sprint (in seconds): Ava: 58.936 s; Isla: 59.05 s; Noah: 59.011 s; Mia: 58.935 s; Ben: 59.07 s. Who was the fastest (shortest time)?

(A) Ava

(B) Isla

(C) Noah

(D) Mia

(E) Ben

7. A flight leaves Los Angeles at 7:00 pm on Sunday and takes 14 hours to reach Sydney. Sydney is 18 hours ahead of Los Angeles. What is the local time in Sydney when the flight lands?

(A) 3:00 am on Sunday

(B) 3:00 am on Monday

(C) 3:00 am on Tuesday

(D) 9:00 am on Monday

(E) 3:00 pm on Sunday

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8. In a sequence, each term is obtained by multiplying the previous term by the same whole number. The 1st term is 9 and the 6th term is 288. What is the 2nd term?

(A) 11

(B) 18

(C) 36

(D) 9

(E) 148

9. Consider these three statements.
1) $5/6 - 3/4 < 1/4$
2) $3/5 - 2/5 < 1/3$
3) $1/2 - 1/6 > 1$
Which of the statements are correct?

(A) 2 only

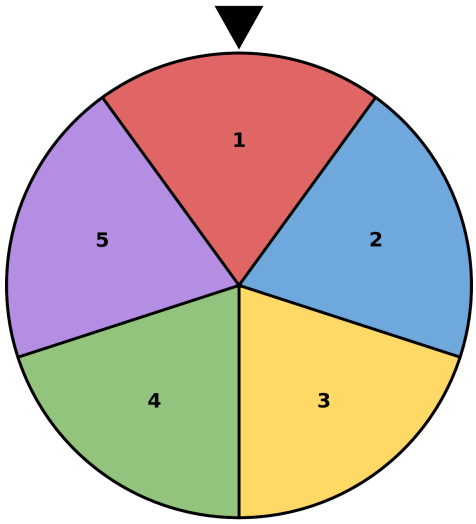
(B) 1 only

(C) 1, 2 and 3

(D) 1 and 2

(E) 3 only

10. The spinner shown has 5 equal sectors labelled 1 to 5. The spinner is spun twice. What is the probability that the two spins show the same number?



(spun twice)

(A) 2/5

(B) 6/25

(C) 4/25

(D) 1

(E) 1/5

11. A book has some pages. On the first day Rina reads 3/4 of the pages. On the second day she reads 1/3 of the remaining pages. She has 40 pages left to read. How many pages does the book have?

(A) 160 pages

(B) 200 pages

(C) 80 pages

(D) 240 pages

(E) 237 pages

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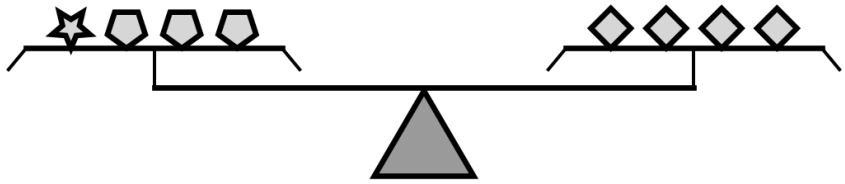
12. The balance scale shown is exactly level. The left pan holds 1 star and 3 pentagons; the right pan holds 4 diamonds. One pentagon weighs 80 g and one diamond weighs 100 g. What is the weight of one star?



1 star + 3 pentagons
each pentagon = 80 g

4 diamonds
each diamond = 100 g

[diagram not to scale]

(A) 106 g

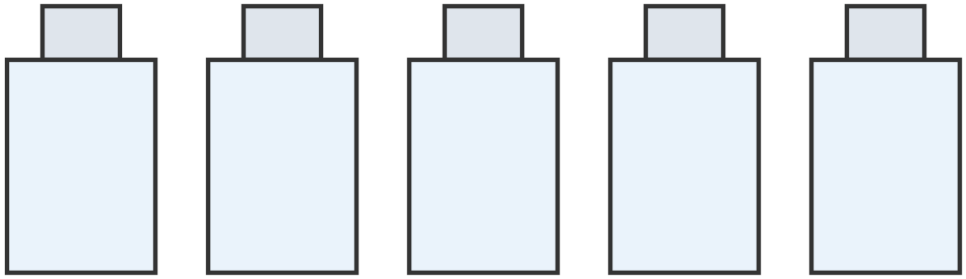
(B) 160 g

(C) 80 g

(D) 260 g

(E) 100 g

13. A pack contains 10 bottles of juice, each 150 mL. After 100 mL is poured out for a recipe, what is the total remaining volume in L?



10 × 150 mL (10 in total, 5 shown)

(A) 1.4 L

(B) 1.5 L

(C) 14 L

(D) 1.25 L

(E) 2.4 L

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14. Georgia has one and a half times as many apples as Zac, and Zac has 5 times as many apples as Quincy. Quincy has 28 apples. How many apples does Georgia have?

(A) 210

(B) 700

(C) 140

(D) 63

(E) 42

15. A bag contains apple, banana and cherry counters (and no others). The probability of spinning (or picking) apple is 1/5, and the probability of banana is 3/10. What is the probability of cherry?

(A) 4/5

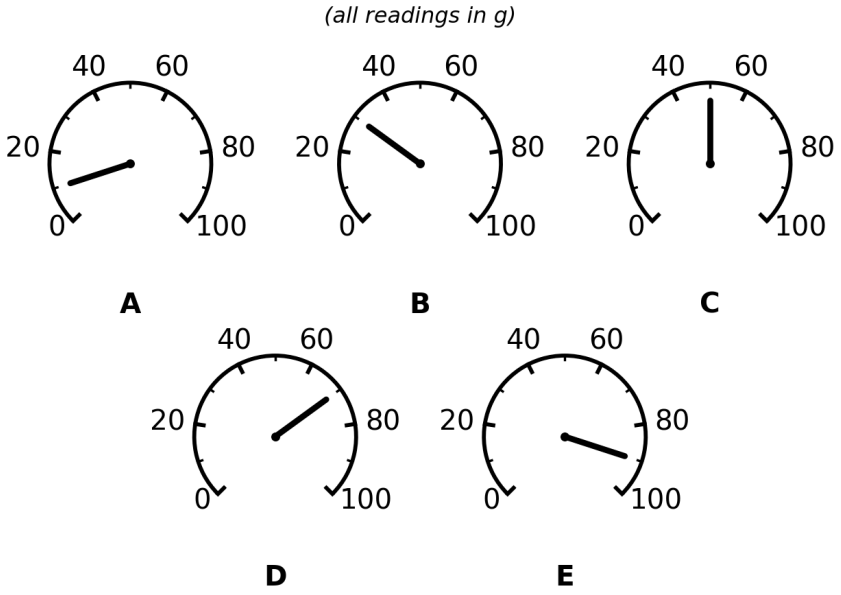
(B) 7/10

(C) 1/10

(D) 1/2

(E) 3/10

16. Five scales, labelled A to E, each show a reading in g. How much more does scale E read than scale B?



(A) 120 g

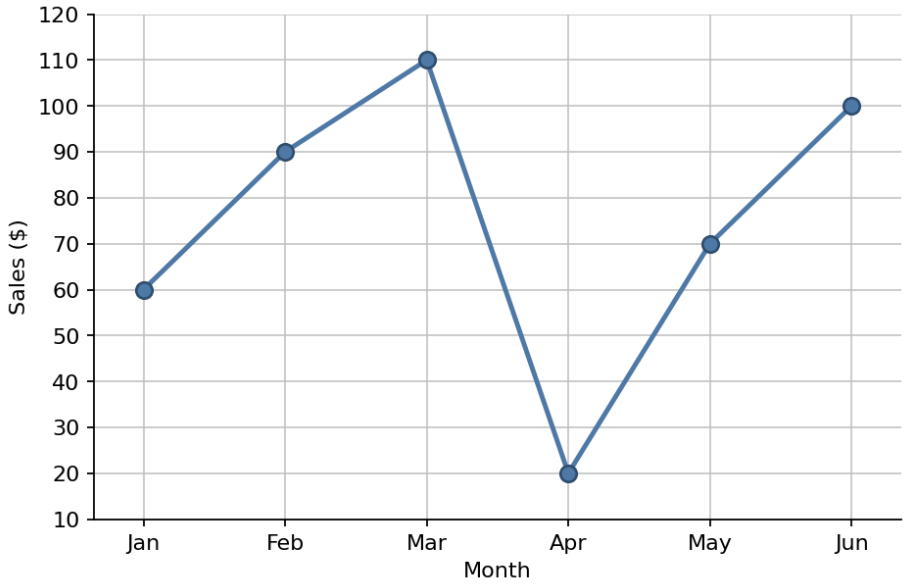
(B) 90 g

(C) 60 g

(D) 30 g

(E) 70 g

17. The line graph shows the monthly revenue of a shop. Consider these statements:
1. The revenue was lowest in Apr.
2. Between Apr and Jun, the revenue rose by $80.
3. Between Jan and Mar, the revenue rose by $40.
Which of the statements are true?



(A) 1 and 2 only

(B) 2 and 3 only

(C) 2 only

(D) 1 only

(E) 1 and 3 only

18. Each shape stands for a whole number. If $2 \times \triangle + 3 \times \bigcirc = 17$ and $\triangle + \bigcirc = 6$, what is the value of $\triangle + 2 \times \bigcirc$?

(A) 1

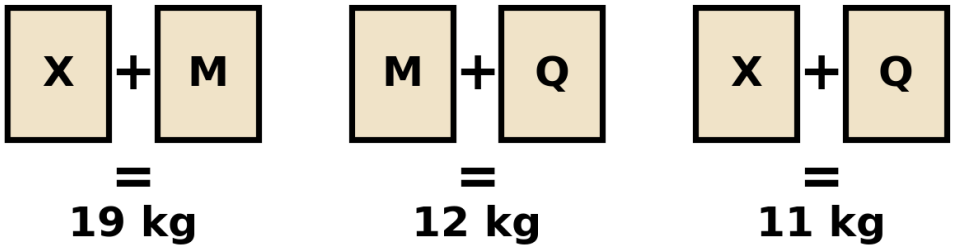
(B) 5

(C) 6

(D) 11

(E) 7

19. Three boxes labelled X, M and Q are weighed two at a time on a balance. Boxes X and M together weigh 19 kg. Boxes M and Q together weigh 12 kg. Boxes X and Q together weigh 11 kg. What is the weight of box X?



(A) 10 kg

(B) 2 kg

(C) 9 kg

(D) 12 kg

(E) 21 kg

20. Rhea walked down the main street with some money. At the bookshop she spent $22. At the supermarket she spent half of the money she had left. At the milk bar she spent $9. Rhea now has $14 left. How much money did Rhea start with?

(A) $5

(B) $45

(C) $54

(D) $68

(E) $46

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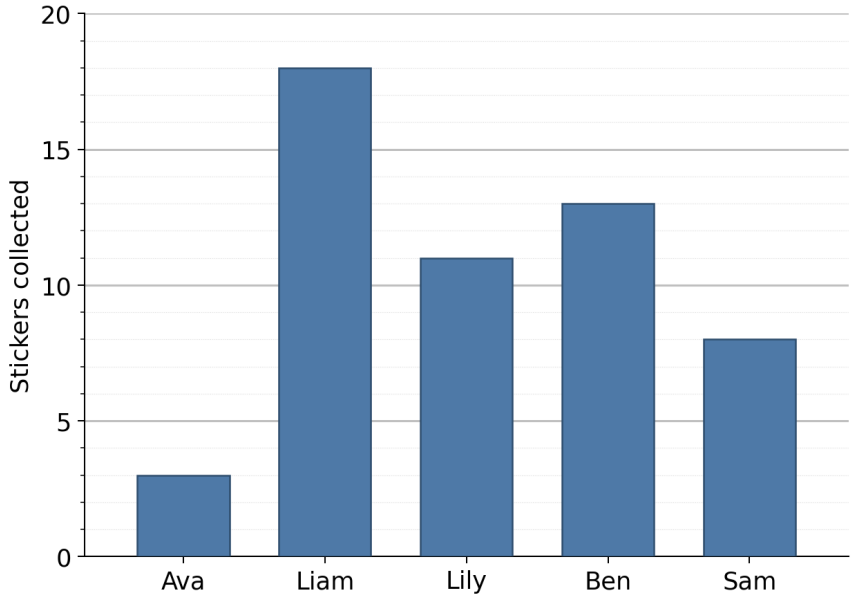
21. The bar graph shows the stickers each child collected. What is the median number of stickers?



(A) 11 stickers

(B) 10 stickers

(C) 18 stickers

(D) 3 stickers

(E) 12 stickers

22. Jia starts with a whole number. Jia's number is multiplied by 3, and then 6 is added. The result is at least 7 and at most 32. What is the sum of all the whole numbers Jia could have picked?

(A) 8

(B) 36

(C) 45

(D) 35

(E) 28

23. Five digit cards show 2, 8, 6, 4 and 0. All five cards are placed in the blanks, one card in each blank, to make this multiplication true:

__ __ × 3 = __ __ __

Which card goes in the tens place of the three-digit answer?

(A) 2

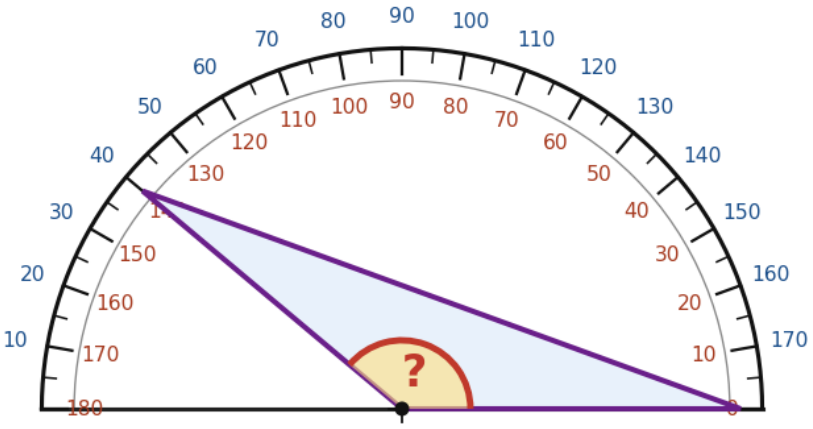
(B) 6

(C) 4

(D) 8

(E) 0

24. A triangle has one of its vertices at the centre of the protractor, with two sides running outwards along the directions shown. What is the size of the marked angle at that vertex?



(A) 40°

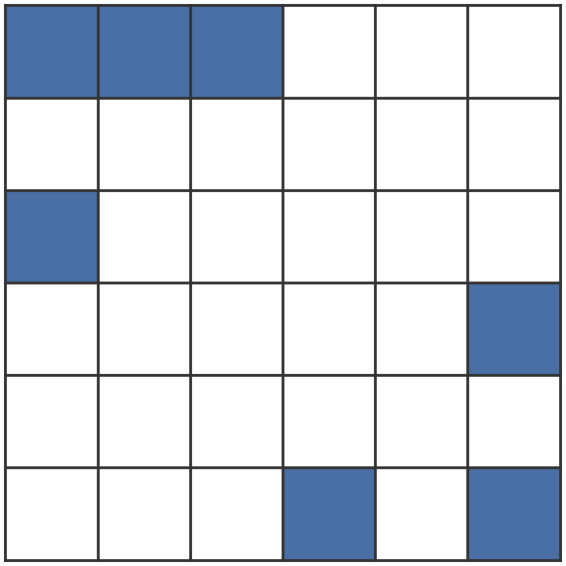
(B) 140°

(C) 130°

(D) 150°

(E) 135°

25. A tile design is drawn on a 6 by 6 grid and has no line of symmetry yet. Counting the diagonals too, how many single blank squares would each give it a line of symmetry when shaded?



(A) 0

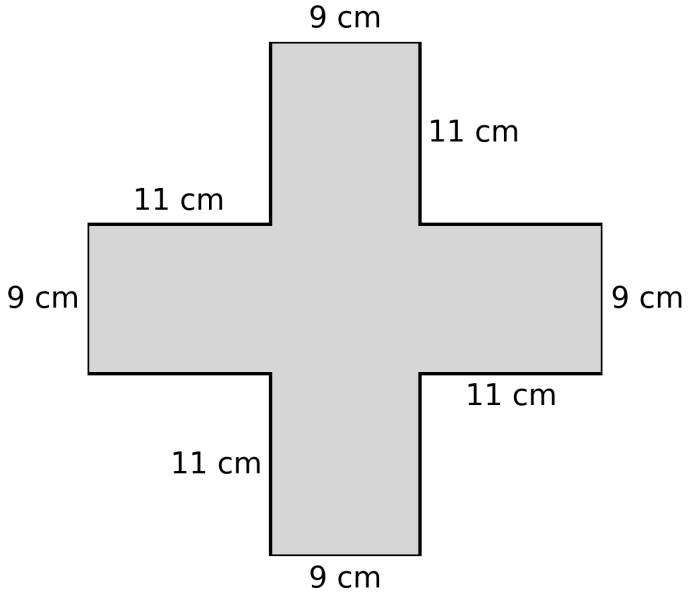
(B) 7

(C) 2

(D) 10

(E) 4

26. A cardboard sign is cut in the shape of a plus sign, as shown. How far is it all the way around the edge of the sign?



(A) 961 cm

(B) 477 cm

(C) 106 cm

(D) 168 cm

(E) 124 cm

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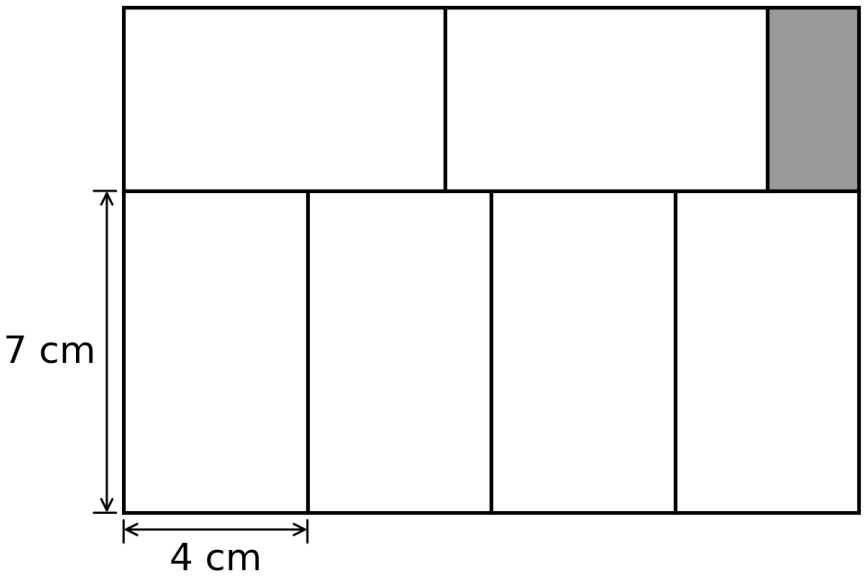
27. A rectangular tray is packed with identical tiles, each 7 cm by 4 cm. Along the bottom, 4 tiles stand upright side by side and fill the tray's width exactly. Along the top, 2 tiles lie flat, end to end. The part of the tray that is not covered is shaded. What is the area of the shaded part?



(A) 56 cm²

(B) 8 cm²

(C) 14 cm²

(D) 176 cm²

(E) 12 cm²

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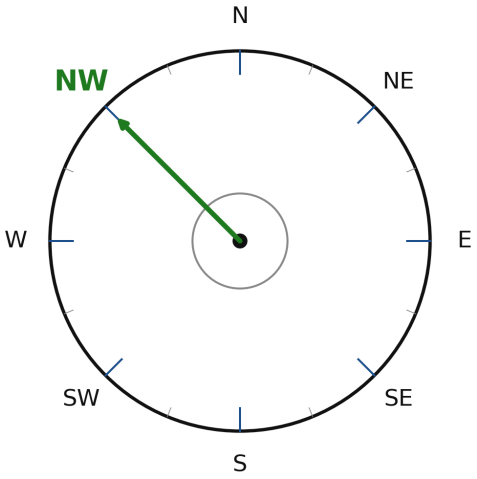
28. A hiker starts facing north-west (NW). She turns 45° anticlockwise, then turns 90° clockwise. In what direction is she now facing?



Hiker starts facing north-west (NW)

(A) S

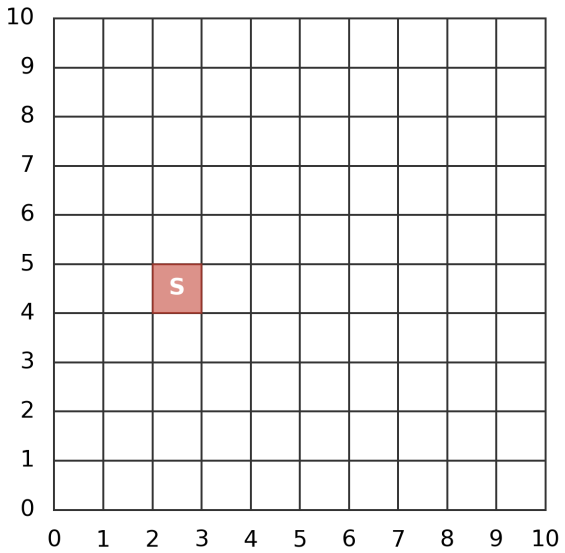
(B) E

(C) NE

(D) N

(E) NW

29. The grid shows a start cell S at (2, 4). Each cell is named by the point at its bottom-left corner. A token on S moves right 4, up 5, down 2 and then left 2. On which cell does the token land?



(A) (7, 4)

(B) (4, 7)

(C) (6, 7)

(D) (5, 7)

(E) (0, 7)

30. A 3-digit number has three different digits chosen from 0 to 9, and the sum of its digits is 18. The number is exactly divisible by 5. What is the largest such number? (digits may include 0 but the number must be a 3-digit number)

(A) 981

(B) 985

(C) 945

(D) 990

(E) 940

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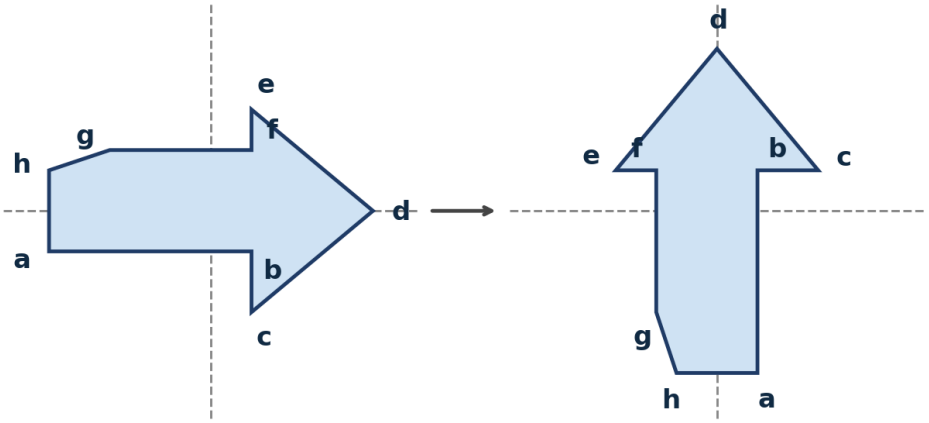
31. The figure on the left has been transformed to produce the figure on the right. Which single transformation was applied?



before after

(A) rotation 90° clockwise

(B) rotation 180°

(C) rotation 270° clockwise (= 90° anticlockwise)

(D) reflection in the vertical axis

(E) reflection in the horizontal axis

32. At an arcade, a cup of 6 arcade tokens costs $6.75 and a single token costs $1.40. Arjun has $18. He buys as many cups of 6 as he can. Then, with the money left over, he buys two single tokens. How much money does Arjun have left at the end?

(A) $2.30

(B) $2.80

(C) $3.10

(D) $4.50

(E) $1.70

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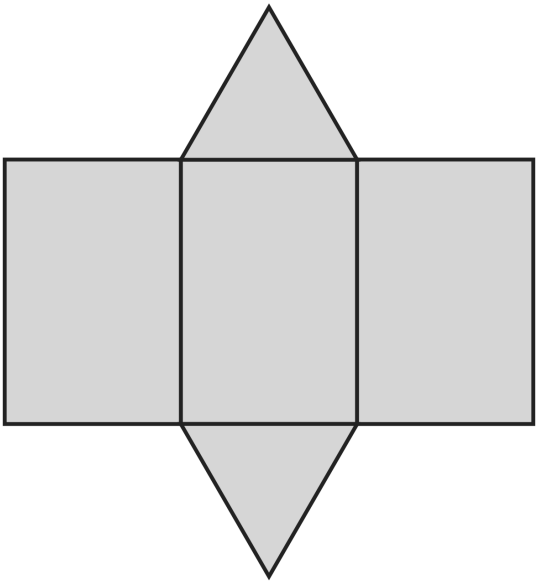
33. Which solid does the net below fold to form?



(A) pentagonal prism

(B) square pyramid

(C) triangular prism

(D) cube

(E) rectangular prism

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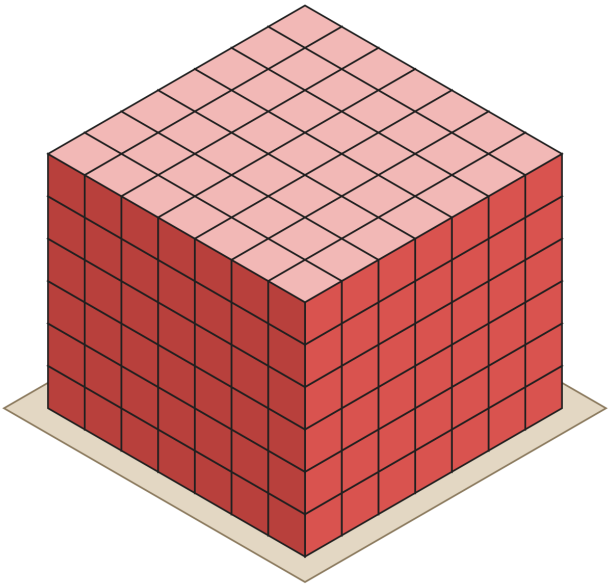
34. A block of small cubes is 7 cubes long, 7 cubes wide and 6 cubes tall. It sits on a table and is sprayed with red paint, as shown. The paint covers the top and all four sides but not the bottom, which is on the table. The block is then taken apart. How many of the small cubes have exactly one painted face?



(A) 25

(B) 100

(C) 125

(D) 75

(E) 130

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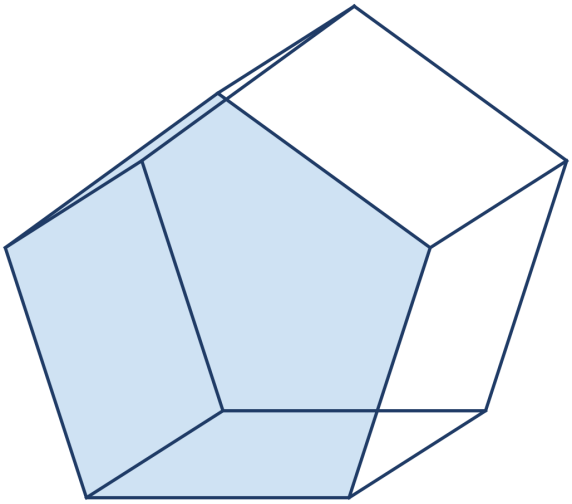
35. A prism has two ends that are regular pentagons with sides 3 cm long. The edges joining the two pentagons are each 8 cm long. What is the total length of all its edges?



(A) 55 cm

(B) 38 cm

(C) 23 cm

(D) 70 cm

(E) 30 cm

Answers and next steps

Download the free Mathematical Reasoning answer key and worked explanations

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