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## PPTC Maths Sample Test

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This is a multiple choice test.

Answers should be marked on the answer sheet provided, not on the test paper. (A copy of the answer sheet, with the correct answers filled in, is provided in order to make marking easier).

Use a pencil to mark your answer in the column that has the same number as the test question by drawing a firm horizontal line through the rectangle next to your answer.

If you make a mistake, rub it out and put in your new answer. You should only mark one answer for each question.

If you cannot do a question, do not waste time, move onto the next question. If you are not sure of an answer, you should make a guess.

There are 8 questions and you have 8 minutes to do the test.

## Questions

1 Jack was  $x$  years old 4 years ago. How old will he be 6 years from now?

- A**  $x+2$    **B**  $x+4$    **C**  $x+6$    **D**  $x+10$    **E**  $x+8$

2 A, B and C are the angles of an isosceles triangle. Angle A measures  $70^\circ$ . Angle B is greater than  $60^\circ$ . What is the size of angle C?

- A**  $70^\circ$    **B**  $50^\circ$    **C**  $60^\circ$    **D**  $55^\circ$    **E**  $40^\circ$

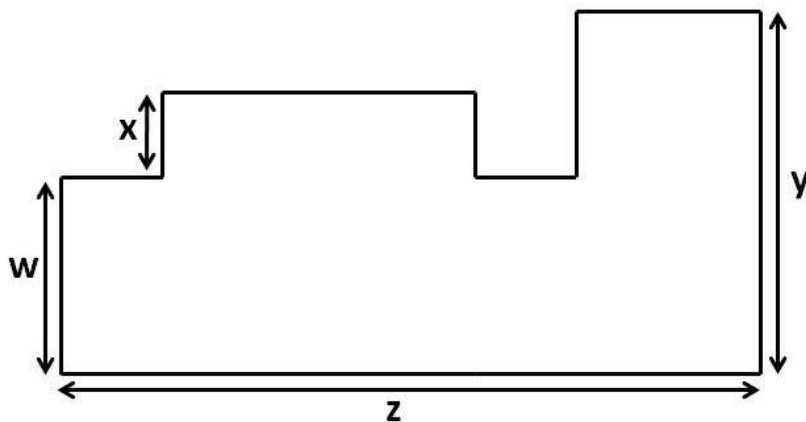
3

|    | m to feet | feet to m |
|----|-----------|-----------|
| 5  | 16.40 ft  | 1.52 m    |
| 8  | ?         | 2.44 m    |
| 10 | 32.81 ft  | 3.05 m    |
| 13 | 42.65 ft  | 3.96 m    |

The table shows some values in a conversion table of metres to feet and feet to metres. From the table you can see that 5 m = 16.4 feet and that 5 feet = 1.52 m. What figure should replace the question mark?

- A** 25.40 ft   **B** 26.25 ft   **C** 23.80 ft   **D** 25.80 ft   **E** 24.90 ft

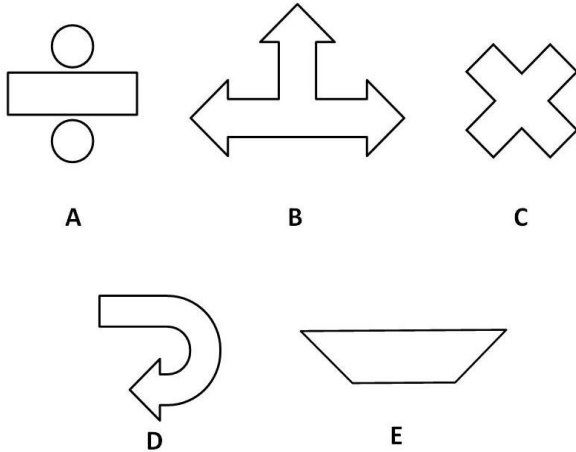
4



What is the perimeter of this shape?

- A**  $2x+2y+2z$    **B**  $w+2x+2z$    **C**  $y+w+x+2z$    **D**  $2w+y+2z$    **E**  $y+w+x+z$

5



Which of these shapes have rotational symmetry?

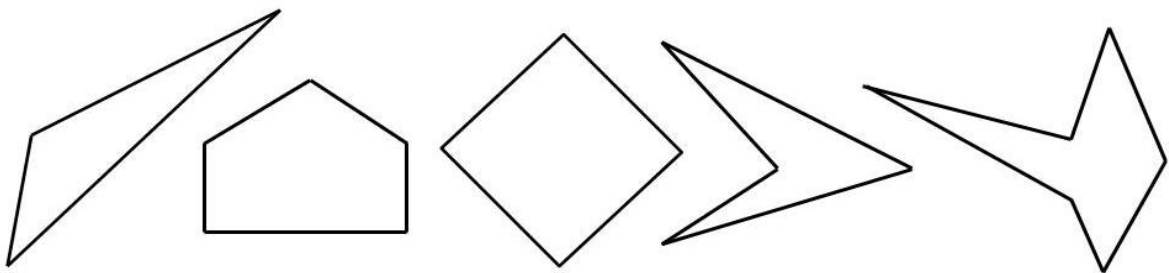
- A** A and B
- B** B and E
- C** C and D
- D** A and C
- E** C and E

6

If  $5x - 6 = 7x + 4$ , what is  $x$ ?

- A** 3    **B** -3    **C** -5    **D** 5    **E** 7

7



How many of these shapes contain interior reflex angles?

- A** 1    **B** 2    **C** 3    **D** 4    **E** 5

# Answers

1 Answer : D  $x+10$

Jack was  $x$  years old 4 years ago, so he is now  $x+4$  years old. In 6 years' time he will be 6 years older i.e. he will be  $x+4+6 = x+10$  years old.

2 Answer : E  $40^\circ$

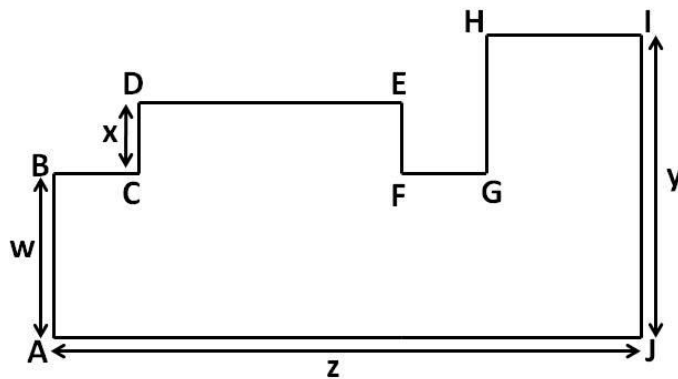
An isosceles triangle has at least 2 equal sides and 2 equal angles. We also know that the angles inside a triangle add up to  $180^\circ$ .

Angle A is  $70^\circ$ , angle B is greater than  $60^\circ$  and therefore angle C is less than  $50^\circ$ . We know that two of these angles must be equal in order for this triangle to be isosceles and the only way that this can be is if angle B = angle A i.e. angle B =  $70^\circ$ . Therefore angle C =  $40^\circ$

3 Answer : B 26.25 ft

The ? represents the value of 8 metres in feet. In the table we are given the values of 5 m, 10 m and 13 m in feet, and we can use this information to find the value of 8 m in feet. We do this by seeing that  $8 = 13 - 5$  and therefore the value of 8 m in feet will be the value of 13 m in feet minus the value of 5 m in feet =  $42.65 - 16.40 = 26.25$  feet (i.e. 26.25 ft)

4 Answer : A  $2x+2y+2z$



the perimeter of this shape is the sum of the lengths of the horizontal segments and the vertical segments

the sum of the lengths of the horizontal segments =  $AJ+BC+DE+FG+HI$

$BC+DE+FG+HI$  is the same as the length of  $AJ$  (i.e.  $z$ ), so

the sum of the lengths of the horizontal segments =  $AJ+(BC+DE+FG+HI) = z+z = 2z$

the sum of the lengths of the vertical segments =  $JI+AB+CD+FE+GH$

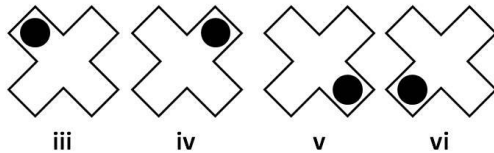
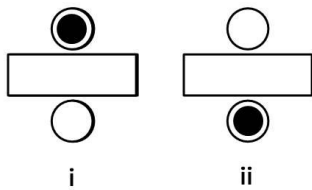
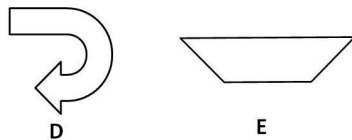
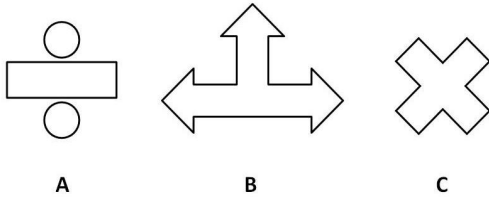
$AB+GH$  is the same length as  $JI$  (i.e.  $y$ ), so

the sum of the lengths of the vertical segments =  $JI+AB+CD+FE+GH = JI + (AB+GH) + CD+FE = y+y+CD+FE = 2y+CD+FE$

CD is of length  $x$  and CD is the same length as FE, so we have  
 the sum of the lengths of the vertical segments =  $2y+CD+FE = 2y+x+x = 2y+2x$

so the perimeter of the shape = sum of the lengths of the horizontal segments + sum of  
 the lengths of the vertical segments =  $2z+2y+2x = 2x+2y+2z$

5 Answer : D A and C



shape A has rotational symmetry of order 2 (i.e. it fits onto itself twice as it is turned through  $360^\circ$ ). This can be seen in (i) and (ii) above. We have put a blob on the shape in order to more easily see what happens when we rotate the shape. We start from position (i) and end up at position (ii) after rotating the shape  $180^\circ$  clockwise. From position (ii) we end up back at position (i) by rotating the shape a further  $180^\circ$  clockwise. So there are 2 positions in which the shape looks the same when being rotated through  $360^\circ$  and therefore shape A has rotational symmetry of order 2.

shape C has rotational symmetry of order 4 (i.e. it fits onto itself four times as it is turned through  $360^\circ$ ). This can be seen in (iii), (iv), (v) and (vi) above. We have put a blob on the shape in order to more easily see what happens when we rotate the shape. We start from position (iii) and end up at position (iv) after rotating the shape  $90^\circ$  clockwise. From position (iv) we end up at position (v) after rotating the shape  $90^\circ$  clockwise. From position (v) we end up at position (vi) after rotating the shape  $90^\circ$  clockwise. From position (vi) we end up back at position (iii) after rotating the shape a

further  $90^\circ$  clockwise. So there are 4 positions in which the shape looks the same when being rotated through  $360^\circ$  and therefore shape C has rotational symmetry of order 4.

6 Answer : C            -5

$$5x - 6 = 7x + 4$$

to solve for x you need to isolate all of the x terms on one side of the equation.

Performing the same operation on both sides of an equation leaves the equation unchanged (i.e. the equality still holds true). We use this fact to help us isolate x terms.

First we subtract  $5x$  from both sides of the equation i.e.

$$5x - 6 - 5x = 7x + 4 - 5x \text{ which gives us } -6 = 2x + 4$$

then we subtract 4 from both sides of the equation and we get

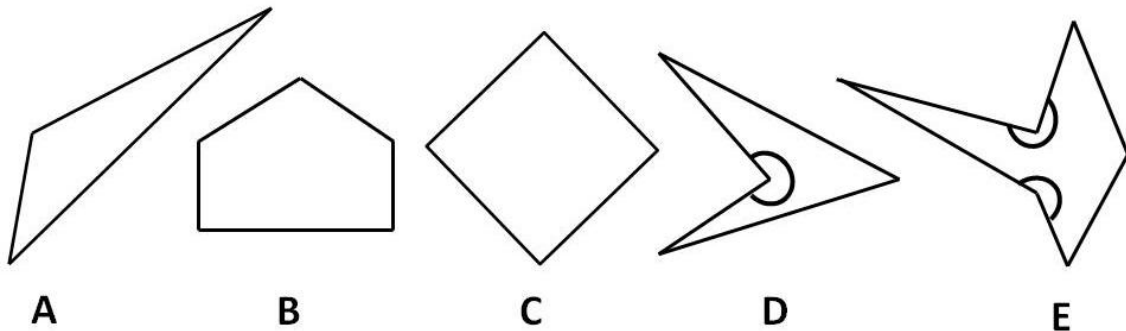
$$-6 - 4 = 2x + 4 - 4 \text{ i.e. } -10 = 2x$$

then we divide both sides of the equation by 2 and we get

$$-5 = x \text{ i.e. } x = -5$$

7 Answer : B            2

a reflex angle is an angle between  $180^\circ$  and  $360^\circ$ . The interior reflex angles of the shapes in the question are shown below



so there are two shapes which contain interior reflex angles i.e. shapes D and E. So the answer is 2

# Answer sheet

Please mark the boxes like  and not like . Rub out mistakes thoroughly

|   |     |     |     |     |     |
|---|-----|-----|-----|-----|-----|
| 1 | [A] | [B] | [C] | [D] | [E] |
| 2 | [A] | [B] | [C] | [D] | [E] |
| 3 | [A] | [B] | [C] | [D] | [E] |
| 4 | [A] | [B] | [C] | [D] | [E] |
| 5 | [A] | [B] | [C] | [D] | [E] |

|   |     |     |     |     |     |
|---|-----|-----|-----|-----|-----|
| 6 | [A] | [B] | [C] | [D] | [E] |
| 7 | [A] | [B] | [C] | [D] | [E] |

# Answer sheet (with correct answers)

|   |                |                |     |                |                |
|---|----------------|----------------|-----|----------------|----------------|
| 1 | [A]            | [B]            | [C] | <del>[D]</del> | [E]            |
| 2 | [A]            | [B]            | [C] | [D]            | <del>[E]</del> |
| 3 | [A]            | <del>[B]</del> | [C] | [D]            | [E]            |
| 4 | <del>[A]</del> | [B]            | [C] | [D]            | [E]            |
| 5 | [A]            | [B]            | [C] | <del>[D]</del> | [E]            |

|   |     |                |                |     |     |
|---|-----|----------------|----------------|-----|-----|
| 6 | [A] | [B]            | <del>[C]</del> | [D] | [E] |
| 7 | [A] | <del>[B]</del> | [C]            | [D] | [E] |