

**CBSE Class 5 Mathematics**  
**NCERT Solutions**  
**CHAPTER-7**  
**CAN YOU SEE THE PATTERN**

**1. What should come next?**

**(a)**



**(b)**



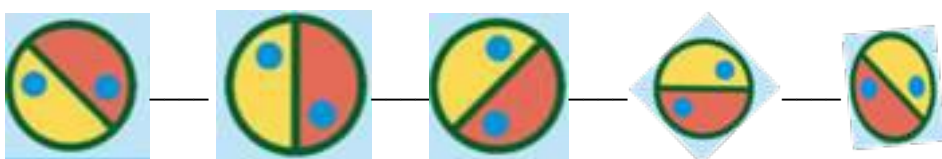
**(c)**



**(d)**



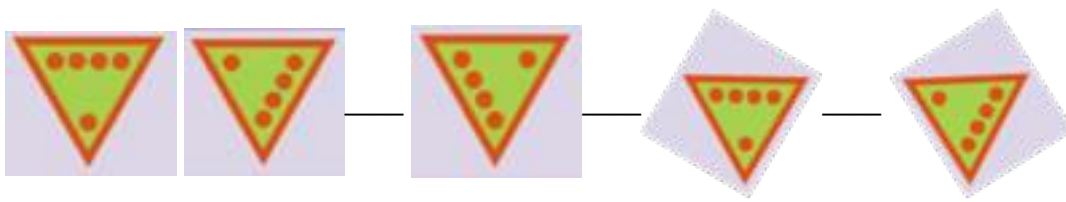
**Ans. (a)**



(b)



(c)



(d)



2. See this pattern

(a)



The rule of the pattern is — turning by  $45^\circ$  each time. Which will be the next? Tick the (✓) right one.



Ans.



### 3. Magic Squares

**Do you remember magic triangles? Come now, let's make some magic squares.**

**Q. Fill this square using all the numbers from 46 to 54.**

**Ans.** In this magic square, the sum of each of the row of numbers (across down and diagonally) is always the same. We have to complete the magic squares, remembering that the numbers in each line are equal to 150.

Clearly:

In 3 rd row: The required number=  $150 - 52 - 47 = 150 - 99 = 51$

In 3 rd column: The required number =  $150 - 49 - 47 = 150 - 96 = 54$

In 2 nd row: The required number =  $150 - 46 - 54 = 150 - 100 = 50$

In 2 nd column: The required number=  $150 - 50 - 52 = 150 - 102 = 48$

In 1 st row: The required number=  $150 - 18 - 49 = 150 - 97 = 53$

Therefore, the complete magic square is

|    |    |    |
|----|----|----|
| 53 | 48 | 49 |
| 46 | 50 | 54 |
| 51 | 52 | 47 |

**Q. Fill this square suing all the numbers from 21 to 29.**

**Rule: The total of each side is 75.**

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**Ans.** Let us fix 26 on the top most left hand side box.

Taking the diagonal of the square, we have

$$26+25=51 \text{ and } 75-51=24$$

Therefore, put 24 at the end of this diagonal.

Fix 22 on the top most-right side box.

Taking the diagonal in which 22 lies, we have

$$22+25=47 \text{ and } 75-47=28$$

Therefore, put 28 at the end of this diagonal.

Clearly,

$$\text{In 1 st row: The required number} = 75 - (26 + 22) = 75 - 48 = 27$$

$$\text{In 1 st column: The required number} = 75 - (26 + 28) = 75 - 54 = 21$$

$$\text{In 2 nd row: The required number} = 75 - (21 + 25) = 75 - 46 = 29$$

$$\text{In 2 nd column: The required number} = 75 - (28 + 24) = 75 - 52 = 27$$

Therefore, the complete magic square is as shown below:

|    |    |    |
|----|----|----|
| 26 | 27 | 22 |
| 21 | 25 | 29 |
| 28 | 23 | 24 |

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**3. Fill in the blank spaces in the same way.**

**(a)**  $14 + \dots + \dots = 34 + 24 + 20$

**(b)**  $\dots + 42 + \dots = 65 + \dots + 80$

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(c)  $200 + 300 + \dots = \dots + 400 + \dots$

(d)  $\dots + \dots + \dots = \dots + \dots + \dots$

**Ans. (a)**  $14 + 20 + 34 = 34 + 14 + 20$

(b)  $80 + 42 + 65 = 65 + 42 + 80$

(c)  $200 + 300 + 400 = 300 + 400 + 200$

(d)  $34 + 29 + 47 = 47 + 34 + 29$

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**4. Now you try and change these numbers into special numbers:**

(a) 28

(b) 132

(c) 273

**Ans. (a)**

|  |     |
|--|-----|
| Given number   | 28  |
| Then turn it back to front                               | 82  |
| Then add them two together<br>It is not a special number |     |
| Now carry on with the number                             | 110 |
| Again turn it back two together                          | 011 |
| Then add them two together                               | 121 |
| 121 is the required special number                       |     |

(b)

|                            |     |
|----------------------------|-----|
| Given number               | 132 |
| Then turn it back to front | 231 |

|                                    |     |
|------------------------------------|-----|
| Then add them two together         | 363 |
| 363 is the required special number |     |

**(c)**

|                                     |      |
|-------------------------------------|------|
| Given number                        | 273  |
| Then turn it back to front          | 372  |
| Then add them two together          | 645  |
| It is not a special number          |      |
| Now carry on with the number        | 645  |
| Again turn it back two together     | 546  |
| Then add them two together          | 1191 |
| It is not a special number          |      |
| Now carry on with the number        | 1191 |
| Again turn it back two together     | 1911 |
| Then add them two together          | 3102 |
| It is not a special number          |      |
| Now carry on with the number        | 3102 |
| Again turn it back two together     | 2013 |
| Then add them two together          | 5115 |
| 5115 is the required special number |      |

**5. Choose any 3 × 3 box from a calendar and find the total in the same way. Play this game with your family.**

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**Ans.** Let us mark a  $3 \times 3$  box (9 dates) on the calendar and see some magic.

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 |    |    |    |    |

Take the smallest number: 2

Add 8 to it: +8

10

Multiply it by  $9 \times 9$

Total 90

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**6. Take any number. Now multiply it by 2, 3, ..... at every step. Also add 3 to it at each step. Look at the difference in the answer. Is it the same at every step?**

$$12 \times 2 + 3 = 27$$

$$12 \times 3 + 3 = 39$$

$$12 \times 4 + 3 = 51$$

$$12 \times 5 + 3 = 63$$

$$12 \times \square + 3 = \square$$

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$$\square \times 7 + 3 = \square$$

$$\square \times \square + 3 = \square$$

$$\square \times \square + \square = \square$$

**Ans.** Filling in the blank boxes, we have

$$12 \times 6 + 3 = 75$$

$$12 \times 7 + 3 = 87$$

$$12 \times 8 + 3 = 99$$

$$12 \times 9 + 3 = 111$$

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**7. Look at the numbers below. Look for the pattern. Can you take it forward?**

$$(9 - 1) \div 8 = 1$$

$$(98 - 2) \div 8 = 12$$

$$(987 - 3) \div 8 = 123$$

$$(9876 - 4) \div 8 = \underline{\hspace{2cm}}$$

$$(98765 - 5) \div 8 = \underline{\hspace{2cm}}$$

$$(\underline{\hspace{2cm}} - \underline{\hspace{2cm}}) \div 8 = \underline{\hspace{2cm}}$$

$$(\underline{\hspace{2cm}} - \underline{\hspace{2cm}}) \div 8 = \underline{\hspace{2cm}}$$

**Ans.** Yes, the given pattern can be taken forward as under:

$$(9 - 1) \div 8 = 1$$

$$(98 - 2) \div 8 = 12$$

$$(987 - 3) \div 8 = 123$$

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$$(9876 - 4) \div 8 = 1234$$

$$(98765 - 5) \div 8 = 12345$$

$$(987654 - 6) \div 8 = 123456$$

$$(9876543 - 7) \div 8 = 1234567$$

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## 8. Smart Adding

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55$$

$$11 + 12 + \dots + \dots + \dots + \dots + \dots + \dots + \dots + 20 = 155$$

$$21 + \dots + \dots + \dots + \dots + \dots + \dots + \dots + 30 = \dots$$

$$31 + \dots + \dots + \dots + \dots + \dots + \dots + \dots + 40 = \dots$$

$$41 + \dots + \dots + \dots + \dots + \dots + \dots + \dots + 50 = \dots$$

$$51 + \dots + \dots + \dots + \dots + \dots + \dots + \dots + 60 = 555$$

$$61 + \dots + \dots + \dots + \dots + \dots + \dots + \dots + 70 = \dots$$

$$\text{Ans. } 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55$$

$$11 + 12 + 13 + 14 + 15 + 16 + 17 + 18 + 19 + 20 = 155$$

$$21 + 22 + 23 + 24 + 25 + 26 + 27 + 28 + 29 + 30 = 255$$

$$31 + 32 + 33 + 34 + 35 + 36 + 37 + 38 + 39 + 40 = 355$$

$$41 + 42 + 43 + 44 + 45 + 46 + 47 + 48 + 49 + 50 = 455$$

$$51 + 52 + 53 + 54 + 55 + 56 + 57 + 58 + 59 + 60 = 555$$

$$61 + 62 + 63 + 64 + 65 + 66 + 67 + 68 + 69 + 70 = 655$$

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**9. Take the first two odd numbers, now add the, see what you get.**

**Now, at every step, add the next odd number.**

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$$1 + 3 = 4 = 2 \times 2$$

$$1 + 3 + 5 = 9 = 3 \times 3$$

$$1 + 3 + 5 + 7 = 16 = 4 \times 4$$

$$1 + 3 + 5 + 7 + 9 = \square$$

$$1 + 3 + 5 + 7 + 9 + 11 = \square = \square \times \square$$

$$1 + 3 + 5 + 7 + 9 + 11 + 13 = \square \times \square$$

**How far can you go on?**

**Ans.** Let us complete it.

$$1 + 3 + 5 + 7 + 9 = 25 = 5 \times 5$$

$$1 + 3 + 5 + 7 + 9 + 11 = 36 = 6 \times 6$$

$$1 + 3 + 5 + 7 + 9 + 11 + 13 = 49 = 7 \times 7$$

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## 10. Secret Numbers

**Banno and Vinod were playing a guessing game by writing clues about a secret number. Each tried by writing clues about a secret number. Each tried to guess the other's secret number from the clues.**

**Can you guess their secret numbers?**

**(a) It is larger than half of 100.**

**Ans. (a)** It is larger than half of 100 means  $> 50$ .

**(b) It is more than 6 tens and less than 7 tens.**

**Ans. (b)** It is more than 6 tens and less than 7 tens it lies between 60 and 70.

**(c) The tens digit is one more than the one's digit.**

**Ans. (c)** The tens digit is one more than one's digit is  $6 - 5 = 5$ .

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**(d) Together the digits have a sum of 11.**

**Ans. (d)** Together the digits have the sum of 11, so the number is 65.

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**11. Write a set of clues for a secret number of your own. Then give it to a friend to guess your secret answer.**

**Ans.** A set of clues to find secret numbers are:

\_\_\_ It is larger than half of 100.

It is more than 7 tens and less than 8 tens.

The tens digit is one less than the one's digit.

Together the digits have a sum of 15.

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**12. (a) Ask your friend-Write down his age. Add 5 to it. Multiply the sum by 2. Subtract 10 from it. Next divide it by 2. What do you get?**

**Ans.(a)** Age: 7

Add 5 to it:  $7 + 5 = 12$

Multiply the sum by 2 =  $12 \times 2 = 24$

Subtract 10 from it =  $24 - 10 = 14$

Divide it by 2 =  $14/2 = 7$

My friend got the answer as his age. So, he is surprised.

**(b) Take a number**

**Double it  $\times 2 =$**

**Multiply it by 5   $\times 5 =$**

**Divide your answer by 10 =   $\div 10 =$**

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**Ans. (b)** Take a number as 5(say)

Double it  $5 \times 2 = 10$

Multiply by 5  $= 10 \times 5 = 50$

Divide your answer by 10  $= 50 \div 10 = 5$

Thus, we got the supposed answer.

**(c) Look at this pattern of number and take it forward.**

$$1 = 1 \times 1$$

$$121 = 11 \times 11$$

$$12321 = 111 \times 111$$

$$1234321 = ?$$

**Ans. (c)** Taking the pattern forward, we have

$$1234321 = 1111 \times 1111.$$