

Number sequences

Write the missing numbers in these sequences.

- ① 3, 8, 13, 18, 23, 28, 33, _____
- ② 32, 39, _____, 53, 60, 67, 74
- ③ 36, 33, 30, 27, 24, 21, _____
- ④ 16, 17, 19, 22, 26, 31, _____, 44, 52, 61
- ⑤ 500, 480, 461, 443, 426, _____, 395, 381
- ⑥ 1, 2, 4, 8, 16, 32, _____, 128, 256, 512
- ⑦ 10 000, 5000, 2500, _____, 625
- ⑧ 3, 9, 27, 81, _____, 729, 2187
- ⑨ 0, 1, 1, 2, 3, 5, 8, 13, _____, 34, 55
- ⑩ 367, 350, 333, 316, _____, 282, 265

What would be the third number in the sequence when you follow the given instructions? Complete the calculations mentally and write the answers.

- ⑪ Start at 4. Subtract 2 and multiply by 3.
4, --, --, _____
- ⑫ Start at 5. Multiply by 2 and subtract 3.
5, --, --, _____
- ⑬ Start at 8. Subtract 6, multiply by 3 and then add 2.
8, --, --, _____
- ⑭ Start at 30. Add even consecutive numbers from 4.
30, --, --, _____

Score 2 points for each correct answer!

SCORE /28 0-12 14-22 24-28

Statistics & Probability

Investigating games of chance

In this game of chance, a regular deck of cards is used, without the jokers. Two cards are turned up. If the next card turned up is equivalent in value to one of those cards, or in between them, the player wins.

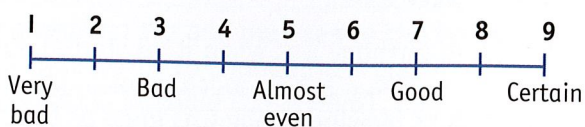


Aces are valued at 1, Jacks at 11, Queens at 12 and Kings at 13. The suit or colour of the cards does not matter.

Score 2 points for each correct answer!

SCORE /22 0-8 10-16 18-22

For example, if the two cards turned up are an eight and a Queen, the player wins if the next card turned up is an 8, 9, 10, Jack or Queen.



Work out what the chance of winning is. Write the matching number from the probability scale above.

- ① The two cards turned up are a 6 and a jack.

- ② The two cards turned up are a 9 and a 10.

- ③ The two cards turned up are a 7 and a 4.

- ④ The two cards turned up are a queen and a 9.

- ⑤ The two cards turned up are a 3 and a 4.

- ⑥ The two cards turned up are an 8 and an 8.

Answer these questions as simplified fractions.

Hint: Two cards have been taken out, so your fractions will be fiftieths.

For the cards turned up, the probability of turning up the same value is $\frac{3}{50}$. For all the other cards, the probability is $\frac{4}{50}$.

- ⑦ The two cards turned up are a 2 and a 7.

- ⑧ The two cards turned up are a King and an 8.

- ⑨ The two cards turned up are a 5 and a 5.

- ⑩ The two cards turned up are a Jack and a Queen.

- ⑪ The two cards turned up are a 9 and a 7.

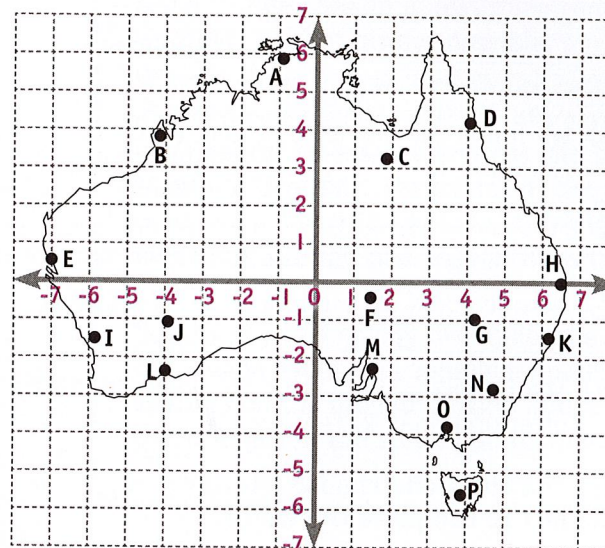
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Measurement & Geometry

Describing locations

Use this map of Australia on a Cartesian plane to answer the following questions. Round the coordinates to the nearest 0.5.



- ① What point is at coordinates (2, 3)?
- ② What point is at coordinates (4, 4)?
- ③ What point is at coordinates (-4, -1)?
- ④ What point is at coordinates (-4, 4)?
- ⑤ What point is at coordinates (4, -5.5)?
- ⑥ What point is at coordinates (-1, 6)?
- ⑦ What are the coordinates of L? _____
- ⑧ What are the coordinates of E? _____
- ⑨ What are the coordinates of G? _____
- ⑩ What are the coordinates of K? _____

Score 2 points for each correct answer!

SCORE /20 0-8 10-14 16-20

Problem Solving

Break the code. The letters of the alphabet have been given this sequence: multiply the letter's place in the alphabet by 8, subtract 4 and then multiply by 3.

For example:

- A = 12
- B = 36
- C = 60

You may use a calculator.

- ① 180, 348, 540, 84, 588

- ② 180, 348, 276, 12

- ③ 444, 12, 276, 12, 12, 300

- ④ 324, 12, 300, 12, 444, 468, 108

The following questions are based on the card game in Statistics & Probability.

- ⑤ A player had $\frac{14}{50}$ chance of winning. One of the turned-up cards was 6. What are the two possibilities for the other turned-up card?

- ⑥ A player had $\frac{26}{50}$ chance of winning. One of the turned-up cards was 7. What are the two possibilities for the other turned-up card?

- ⑦ A player had $\frac{18}{50}$ chance of winning. For the player to win, a Queen is the highest card that can be turned up next. What two cards did the player already have?

Use the map of Australia in Measurement & Geometry to answer these questions.

Assume the grid lines are 150 km apart from north to south and from east to west and 180 km apart diagonally. Round the coordinates to the nearest 0.5. You may use a calculator.

- ⑧ How far apart are I and K?

- ⑨ What is the shortest distance between L and E?

- ⑩ Without travelling diagonally, how far apart are E and D?

- ⑪ What is the shortest distance between B and O?

