

Number sequences with fractions and decimals

Write the missing numbers in these sequences. You may use a calculator.

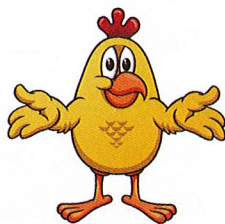
- ① 37.5, 69.5, 101.5, 133.5, 165.5, \_\_\_\_\_
- ②  $43\frac{3}{8}$ ,  $49\frac{4}{8}$ ,  $55\frac{5}{8}$ , \_\_\_\_\_,  $67\frac{7}{8}$ , 74,  $80\frac{1}{8}$
- ③ 10, 25, 62.5, 156.25, 390.625, \_\_\_\_\_
- ④  $256\frac{2}{16}$ ,  $260\frac{3}{16}$ ,  $264\frac{4}{16}$ , \_\_\_\_\_,  $272\frac{6}{16}$ ,  $276\frac{7}{16}$
- ⑤ 0.751, \_\_\_\_\_, 2.251, 3.001, 3.751, 4.501, 5.251
- ⑥  $82\frac{5}{8}$ ,  $93\frac{2}{8}$ ,  $103\frac{7}{8}$ ,  $114\frac{4}{8}$ , \_\_\_\_\_,  $135\frac{6}{8}$ ,  $146\frac{3}{8}$ , 157
- ⑦ 24, 40, 72, 136, 264, \_\_\_\_\_, 1032, 2056

These sequences involve two steps. The first is doubling and the second step is subtracting a number. Write the missing numbers.

- ⑧ 16, 22, 34, 58, 106, 202, 394, \_\_\_\_\_
- ⑨ 200, 300, 500, 1700, 3300, \_\_\_\_\_, 12 900, 25 700
- ⑩ 20, 27.5, 42.5, 72.5, 132.5, 252.5, \_\_\_\_\_, 972.5
- ⑪ 1, 1.25, 1.75, 2.75, 4.75, 8.75, 16.75, \_\_\_\_\_, 64.75, 125.75
- ⑫ 12.75, 17.5, 27, 46, 84, \_\_\_\_\_, 312, 616

What would be the third number in the sequence when you follow the given instructions?

- ⑬ Add  $6\frac{3}{7}$   
15, --, --, \_\_\_\_\_
- ⑭ Add 0.009  
0.003, --, --, \_\_\_\_\_
- ⑮ Subtract 0.085  
100, --, --, \_\_\_\_\_



Score 2 points for each correct answer! SCORE /30 0-12 14-24 26-30

Investigating games of chance

**Pachinko** is a game of chance popular in Japan. In this game, balls fall down an obstacle track. With luck, some balls come out. The chance of a ball coming out depends on which zone it is dropped into.

This version of pachinko has three zones. Here are the probabilities for balls coming out when they are dropped into each of the three zones.

- Zone 1: Chance of a ball coming out =  $\frac{1}{6}$
- Zone 2: Chance of a ball coming out =  $\frac{5}{6}$
- Zone 3: Chance of a ball coming out =  $\frac{1}{6}$

Example:

12 balls were dropped into Zone 1.  
36 balls were dropped into Zone 2.  
19 balls were dropped into Zone 3.  
How many balls probably came out?

$$12 \times \frac{1}{6} + 36 \times \frac{5}{6} + 19 \times \frac{1}{6}$$

$$= 2 + 30 + 3\frac{1}{6} \text{ (Round } 3\frac{1}{6} \text{ to 3, as you can't have fractions of balls in real life.)}$$

$$2 + 30 + 3 = 35 \text{ balls}$$

How many balls probably came out in these games of pachinko?

- ① 26 balls were dropped into Zone 1.  
9 balls were dropped into Zone 2.  
24 balls were dropped into Zone 3.
- ② 32 balls were dropped into Zone 1.  
13 balls were dropped into Zone 2.  
20 balls were dropped into Zone 3.
- ③ 8 balls were dropped into Zone 1.  
56 balls were dropped into Zone 2.  
21 balls were dropped into Zone 3.

This version of pachinko has five zones. Here are the probabilities for balls coming out when they are dropped into each zone.

- Zone 1: Chance of a ball coming out =  $\frac{1}{9}$
- Zone 2: Chance of a ball coming out =  $\frac{3}{8}$
- Zone 3: Chance of a ball coming out =  $\frac{1}{2}$
- Zone 4: Chance of a ball coming out =  $\frac{3}{8}$
- Zone 5: Chance of a ball coming out =  $\frac{1}{9}$

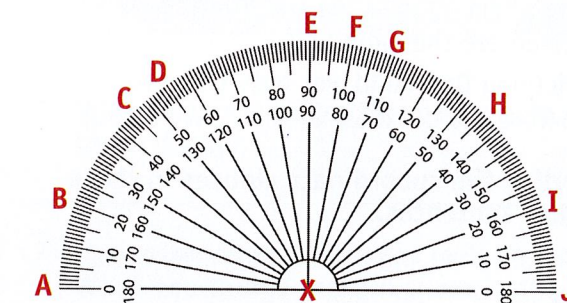
Break the code. The letters of the alphabet have been given this sequence: the letter's place in the alphabet + 9, × 5 and then - 7. For example:

- A = 93
- B = 98
- C = 103

You may use a calculator.

- ① 93, 108, 133, 113, 193
- ② 188, 163, 188, 183, 133, 113, 158, 183
- ③ 93, 178, 178, 133, 208, 113, 108, 113, 178, 103, 133
- ④ 183, 93, 213, 163, 158, 93, 178, 93

Use the protractor diagram to answer the following questions.



- ⑤ Start at X, facing directly at I. Turn anticlockwise 60°. What letter are you facing now?
- ⑥ Start at X, facing directly at B. Turn a right angle clockwise. What letter are you facing now?
- ⑦ Start at X, facing directly at H. Turn half a right angle anticlockwise. What letter are you facing now?
- ⑧ Start at X, facing directly at I. Turn anticlockwise 105°. What letter are you facing now?

How many balls probably came out in these games of pachinko?

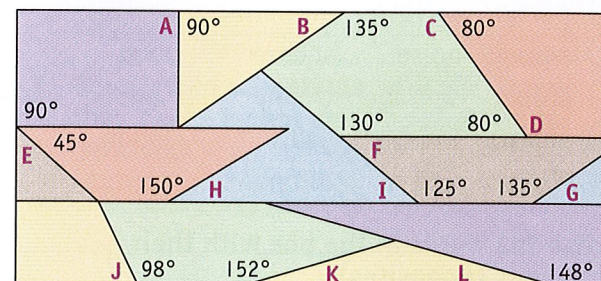
- ④ Zone 1: 18 balls Zone 2: 8 balls  
Zone 3: 21 balls Zone 4: 8 balls  
Zone 5: 14 balls
- ⑤ Zone 1: 6 balls Zone 2: 0 balls  
Zone 3: 20 balls Zone 4: 13 balls  
Zone 5: 4 balls
- ⑥ Zone 1: 25 balls Zone 2: 13 balls  
Zone 3: 41 balls Zone 4: 5 balls  
Zone 5: 1 ball
- ⑦ Zone 1: 36 balls Zone 2: 19 balls  
Zone 3: 32 balls Zone 4: 18 balls  
Zone 5: 35 balls

Score 2 points for each correct answer! SCORE /14 0-4 6-10 12-14

Measurement & Geometry

Investigating angles on straight lines

Write the values of these angles along the straight lines in the diagram.



- ① Angle A = \_\_\_\_\_
- ② Angle B = \_\_\_\_\_
- ③ Angle C = \_\_\_\_\_
- ④ Angle D = \_\_\_\_\_
- ⑤ Angle E = \_\_\_\_\_
- ⑥ Angle F = \_\_\_\_\_
- ⑦ Angle G = \_\_\_\_\_
- ⑧ Angle H = \_\_\_\_\_
- ⑨ Angle I = \_\_\_\_\_
- ⑩ Angle J = \_\_\_\_\_
- ⑪ Angle K = \_\_\_\_\_
- ⑫ Angle L = \_\_\_\_\_



Score 2 points for each correct answer! SCORE /24 0-10 12-18 20-24