



DREAMLINE STEAM OLYMPIAD

5–6

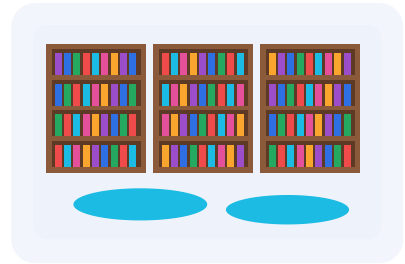
GRADE



Grade 5–6 Mathematics Olympiad Sample Questions

1

A school library has **3,485** books. It receives another **1,275** books and then gives **638** old books to another school. How many books does the library have now?



Ⓐ 4,022

Ⓑ 4,122

Ⓒ 4,222

Ⓓ 4,322

Solution: $3,485 + 1,275 = 4,760$

Then: $4,760 - 638 = 4,122$

✓ **Answer: B) 4,122**

2

Which of the following numbers is divisible by both 6 and 9 but NOT by 12?

Ⓐ 126

Ⓑ 144

Ⓒ 164

Ⓓ 180

Solution: A number divisible by both 6 and 9 must be divisible by

$LCM(6, 9) = 18$.

Check each option: $126 \div 18 = 7$ ✓

• $144 \div 18 = 8$, but $144 \div 12 = 12$ ✗

• $164 \div 18$ is not an integer ✗

• $180 \div 18 = 10$, but $180 \div 12 = 15$ ✗

Therefore, the only number divisible by both 6 and 9, but **not** by 12, is

126.

✓ **Answer: A) 126**

3

Find the next number:

(A) 113**(B)** 128**(C)** 147**(D)** 158**Solution:** Each term is multiplied by 2, then 2 is added:

$$3 \times 2 + 2 = 8$$

$$8 \times 2 + 2 = 18$$

$$\text{Therefore: } 78 \times 2 + 2 = 158$$

✓ **Answer: D) 158**

4Which is the **greatest** number?
 $\frac{3}{5}$, 0.58, 62%, $\frac{5}{8}$
(A) $\frac{3}{5}$ **(B)** 0.58**(C)** 62%**(D)** $\frac{5}{8}$ **Solution:** Convert them to decimals:

$$\frac{3}{5} = 0.60$$

$$0.58 = 0.58$$

$$62\% = 0.62$$

$$\frac{5}{8} = 0.625$$

$$\text{The greatest is: } 0.625 = \frac{5}{8}$$

✓ **Answer: D) $\frac{5}{8}$**

5

A number is multiplied by 4, and then 7 is added. The result is 31.

What is the number?

☐ A 5☒ B 6☐ C 7☐ D 8

Solution: Let the number be x . $4x + 7 = 31$

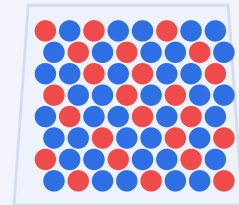
$$4x = 24$$

$$x = 6$$

✓ **Answer: B) 6**

6

The ratio of red to blue marbles in a box is 3:5.
There are **40 marbles** altogether. How many are blue?

☐ A 15☐ B 20☒ C 25☐ D 30

Solution: Total parts: $3 + 5 = 8$

Each part represents: $40 \div 8 = 5$

Blue marbles: $5 \times 5 = 25$

✓ **Answer: C) 25**

7

A car travels at **60 km/h** for 3 hours.
How far does it travel?

☐ A 120 km☐ B 150 km☒ C 180 km☐ D 200 km

Solution: $d = vt \Rightarrow d = 60 \times 3 = 180$

✓ **Answer: C) 180 km**

8

An architect is designing a triangular roof. Two angles of the roof are 48° and 67° . To complete the blueprint, she must find the missing angle.

What is the third angle?



(A) 55°

(B) 65°

(C) 75°

(D) 85°

Solution: The angles of a triangle add to 180° :

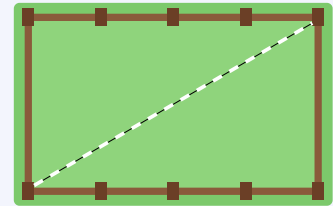
$$180^\circ - 48^\circ - 67^\circ = 65^\circ$$

✓ **Answer: B)** 65°

9

A rectangular field has an area of 96 m^2 . Its length is 12 m .

What is its perimeter?



(A) 32 m

(B) 36 m

(C) 40 m

(D) 44 m

Solution: Find the width: $96 \div 12 = 8 \text{ m}$

Therefore: $P = 2(12 + 8) = 40 \text{ m}$

✓ **Answer: C)** 40 m

10

A rectangular box is made from unit cubes. It is **4 cubes long, 3 cubes wide, and 2 cubes high**. How many unit cubes are needed?



(A) 12

(B) 18

(C) 24

(D) 30

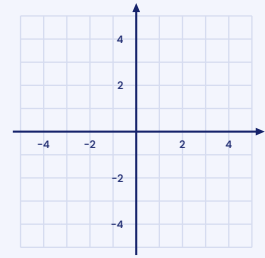
Solution: $4 \times 3 \times 2 = 24$

✓ **Answer: C)** 24

11

A point is at $(2, 3)$. It is moved **4 units right** and **2 units down**.

What are its new coordinates?

**A** $(6, 1)$ **B** $(6, 5)$ **C** $(- , 21)$ **D** $(2, 5)$

Solution: Right 4: $2 + 4 = 6$

Down 2: $3 - 2 = 1$

New point: $(6, 1)$

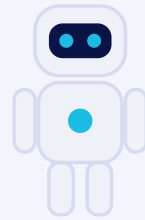
✓ **Answer: A** $(6, 1)$

12

A robot starts at $(0, 0)$. It moves:

- 5 squares east,
- 3 squares north,
- 2 squares west.

Where does it finish?

**A** $(3, 3)$ **B** $(7, 3)$ **C** $(3, 5)$ **D** $(5, 1)$

Solution: Horizontal movement: $5 - 2 = 3$

Vertical movement: 3

So the final position is: $(3, 3)$

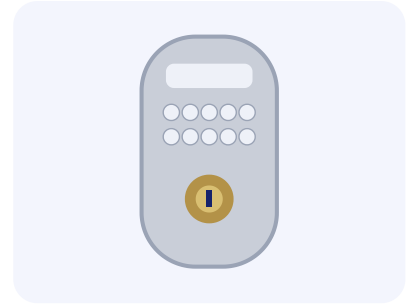
✓ **Answer: A** $(3, 3)$

13

A password consists of **one letter followed by one digit**.

There are 4 possible letters and 5 possible digits.

How many different passwords can be made?

**(A)** 9**(B)** 16**(C)** 20**(D)** 25

Solution: $4 \times 5 = 20$

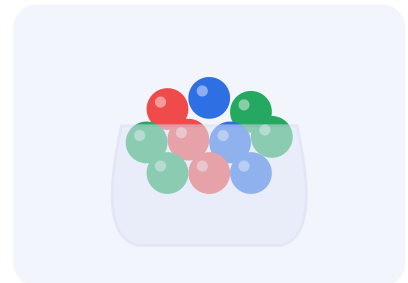
✓ **Answer: C) 20**

14

A bag contains:

- 4 red balls,
- 3 blue balls,
- 5 green balls.

One ball is selected at random. What is the probability that it is **not green**?

**(A)** $\frac{5}{12}$ **(B)** $\frac{7}{12}$ **(C)** $\frac{4}{12}$ **(D)** $\frac{1}{2}$

Solution: Total: $4 + 3 + 5 = 12$

Not green: $4 + 3 = 7$

Therefore: $P(\text{not green}) = \frac{7}{12}$

✓ **Answer: B) $\frac{7}{12}$**

15

Four students—Ali, Ben, Cara, and Dina—stand in a line.

- Ali is before Ben.
- Cara is after Ben.
- Dina is before Ali.

Who must be **first**?


☐ (A) Ali

☐ (B) Ben

☐ (C) Cara

☒ (D) Dina

Solution: The order must be: Dina → Ali → Ben → Cara

✓ **Answer: D) Dina**

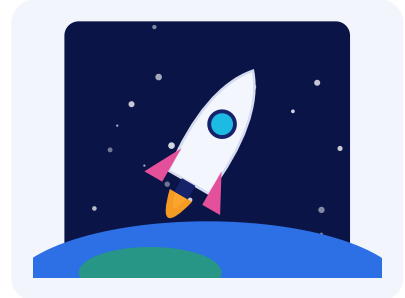
16

A rocket can only launch if the correct code is entered.

The code satisfies the following rule:

- Divide the code by 4.
- Add 9.
- You get 47.

What is the launch code?


☐ (A) 148

☒ (B) 152

☐ (C) 156

☐ (D) 160

Solution: Let the number be x .

$$\frac{x}{4} + 9 = 47$$

$$\frac{x}{4} = 38$$

$$x = 152$$

✓ **Answer: B) 152**

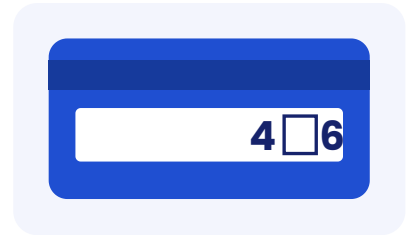
17

A three-digit security code has the form: 4□6

The code is

- divisible by 9,
- divisible by 6,
- but **not divisible by 5**.

What digit belongs in the box?



(A) 3

(B) 5

(C) 7

(D) 8

Solution: For divisibility by 9: $4 + \square + 6 = 10 + \square$
The sum must be a multiple of 9.

Testing the options:

- $10 + 3 = 13$
- $10 + 5 = 15$
- $10 + 7 = 17$
- $10 + 8 = 18 \checkmark$

Thus the digit is **8**. $\Rightarrow 486$

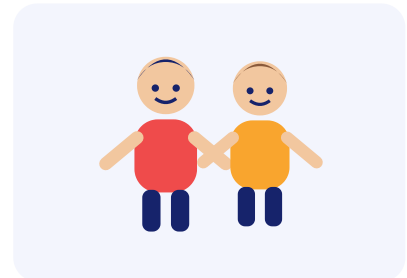
Check: $486 \div 9 = 54$

✓ **Answer: D) 8**

18

My brother's age is equal to the last digit of 3^{2026}

What is my brother's age?



(A) 4

(B) 6

(C) 8

(D) 9

The last digits of powers of 3 repeat: 3, 9, 7, 1

The cycle length is 4. $2026 \div 4 = 506$ remainder 2

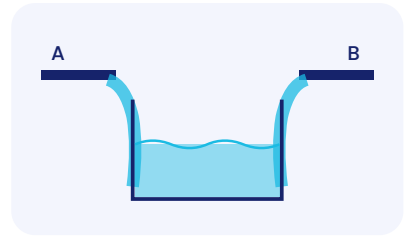
Therefore, use the second number in the cycle: 9

✓ **Answer: D) 9**

19

Pipe A can fill a tank in **4 hours**. Pipe B can fill the same tank in **6 hours**.

What fraction of the tank can they fill together in **1 hour**?



(A) $\frac{1}{10}$

(B) $\frac{5}{12}$

(C) $\frac{1}{2}$

(D) $\frac{2}{3}$

Solution: Pipe A fills: $\frac{1}{4}$ of the tank per hour.

Pipe B fills: $\frac{1}{6}$

Together:

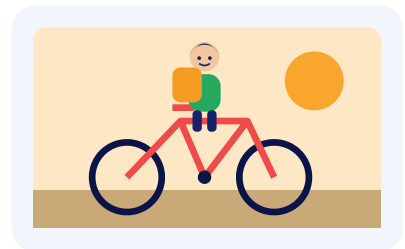
$$\frac{1}{4} + \frac{1}{6} = \frac{3}{12} + \frac{2}{12} = \frac{5}{12}$$

✓ **Answer: B)** $\frac{5}{12}$

20

A cyclist travels **30 km** to a village at 10 km/h, then returns the same distance at 15 km/h.

What is the cyclist's **average speed for the entire trip**?



(A) 11 km/h

(B) 12 km/h

(C) 12.5 km/h

(D) 13 km/h

Solution: Total distance: $30 + 30 = 60$ km

Time going: $30 \div 10 = 3$ h

Time returning: $30 \div 15 = 2$ h

Total time: $3 + 2 = 5$ h

Average speed: $60 \div 5 = 12$ km/h

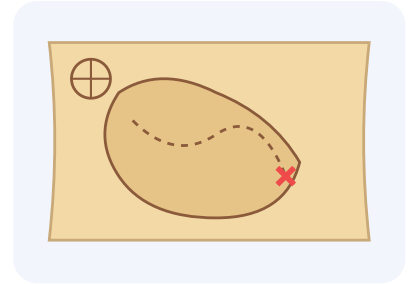
✓ **Answer: B)** 12 km/h

21

A rectangular treasure map is **24 cm** long and **18 cm** wide. A pirate draws a straight line from one corner to the opposite corner.

The diagonal is then increased by **20%** because the map is enlarged.

What is the length of the enlarged diagonal?

**(A)** 32 cm**(B)** 34 cm**(C)** 36 cm**(D)** 40 cm

Solution Original diagonal:

$$\sqrt{24^2 + 18^2} = 30$$

Increase by 20%: $30 \times 1.2 = 36$

✓ **Answer: C) 36 cm**

22

How many **two-digit even numbers** can be made using the digits

1, 2, 3, 4, 5, 6

if no digit may be repeated?

(A) 6**(B)** 8**(C)** 12**(D)** 15

Solution: The units digit must be even:

2 or 4 or 6

So there are 3 choices for the units digit.

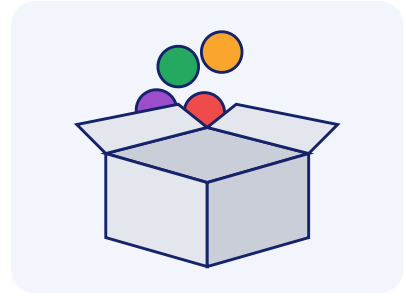
After choosing it, there are 5 choices for the tens digit.

$$3 \times 5 = 15$$

✓ **Answer: D) 15**

23

A box contains balls of **4 different colors**. What is the minimum number of balls you must take without looking to guarantee that **at least 3 balls have the same color**?

**(A)** 7**(B)** 8**(C)** 9**(D)** 10

Solution: In the worst case, you could take:

$$2 + 2 + 2 + 2 = 8$$

without having 3 of any colour.

The next ball guarantees 3 of one colour: $8 + 1 = 9$

✓ **Answer: C) 9**

24

A frog is at the bottom of a **12-meter well**.

- Each day it climbs **4 meters**.
- Each night it slips down **2 meters**.

How many days will it take the frog to get out?

**(A)** 4**(B)** 5**(C)** 6**(D)** 7

Solution Net gain per full day: $4 - 2 = 2$ m

After 4 nights, the frog is at: $4 \times 2 = 8$ m

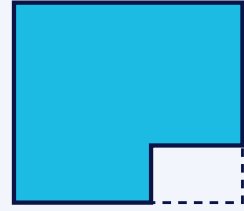
On Day 5, it climbs 4 m: $8 + 4 = 12$ m

It escapes before slipping back.

✓ **Answer: B) 5**

25

A square has side length 10 cm. A smaller square of side 4 cm is removed from one corner. What is the area remaining?

**(A)** 76 cm²**(B)** 80 cm²**(C)** 84 cm²**(D)** 86 cm²

Solution: Large square: $10^2 = 100$

Small square: $4^2 = 16$

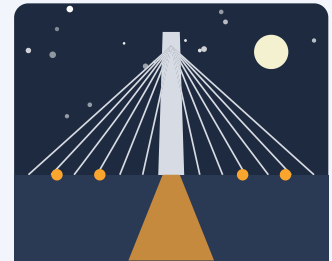
Remaining: $100 - 16 = 84$

✓ **Answer: C)** 84 cm²

26

Four friends need to cross a bridge at night.

- Ali takes **1 minute**.
- Ben takes **2 minutes**.
- Cara takes **7 minutes**.
- Dan takes **10 minutes**.



Only **two people can cross at a time**, and they must carry one flashlight. When two people cross together, they move at the slower person's speed.

What is the **minimum time** needed for all four friends to cross?

(A) 17 minutes**(B)** 19 minutes**(C)** 20 minutes**(D)** 21 minutes

Solution

1. Ali and Ben cross → 2 min

2. Ali returns → 1 min

3. Cara and Dan cross → 10 min

4. Ben returns → 2 min

5. Ali and Ben cross → 2 min

Total: $2 + 1 + 10 + 2 + 2 = 17$

✓ **Answer: A) 17 minutes**

27

A mysterious **three-digit code** must satisfy all of these rules:

- It is **greater than 300**.
- It is **even**.
- It uses only the digits **1, 2, 3, 4, 5**.
- **No digit can be used more than once.**

How many different three-digit codes can be created?



(A) 8

(B) 10

(C) 13

(D) 15

Solution: The hundreds digit must be **3, 4, or 5**.

- If the hundreds digit is **3 or 5**, the units digit must be **2 or 4**:

$$2 \times 2 \times 3 = 12$$

- If the hundreds digit is **4**, the units digit can be **2** only:

$$1 \times 1 \times 3 = 3$$

So: $12 + 3 = \boxed{15}$

Answer: 15

28

A positive integer N is less than 100.

It leaves a remainder of 2 when divided by 3, a remainder of 3 when divided by 5, and a remainder of 1 when divided by 4.

Which is N ?

(A) 43

(B) 48

(C) 53

(D) 58

Solution: We need a number $N < 100$ satisfying all three conditions:

- Dividing by 3 leaves remainder 2: $N \equiv 2 \pmod{3}$
- Dividing by 5 leaves remainder 3: $N \equiv 3 \pmod{5}$
- Dividing by 4 leaves remainder 1: $N \equiv 1 \pmod{4}$

Check the choices:

- $43 \div 3 = 14$ remainder **1** ✗
- $48 \div 3 = 16$ remainder **0** ✗
- $53 \div 3 = 17$ remainder **2** ✓, but $53 \div 5$ has remainder **3** ✓, and $53 \div 4$ has remainder **1** ✓

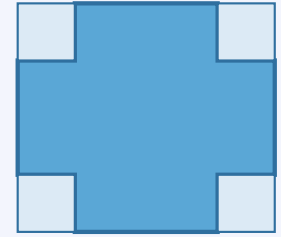
Therefore, $\boxed{N = 53}$

Answer: C) 53

29

A large square has side length 12 cm. Four identical smaller squares, each with side length 3 cm, are removed from its four corners.

What is the perimeter of the remaining figure?

**A** 36 cm**B** 48 cm**C** 60 cm**D** 72 cm

Solution: The original perimeter is: $4 \times 12 = 48$ cm

At each corner, removing a 3×3 square removes 3 cm from each of two outer sides: $3 + 3 = 6$

But it creates two new edges of length 3 cm: $3 + 3 = 6$

So the perimeter does **not change**.

Therefore: 48 cm

✓ **Answer: B)** 48 cm

30

A drawer contains **5 red socks, 6 blue socks, and 7 black socks**.

The room is completely dark, so you cannot see the colors when picking socks.

What is the minimum number of socks you must take to guarantee that you have at least 3 socks of the same color?

**A** 5**B** 6**C** 7**D** 8

Solution

There are **3 colors**: red, blue, and black.

In the worst case, you could pick:

- 2 red socks
- 2 blue socks
- 2 black socks

Total: $2 + 2 + 2 = 6$

You still do **not** have 3 socks of the same color.

The **next sock** (the 7th sock) must be red, blue, or black, giving you **3 socks of one color**.

$6 + 1 = 7$

✓ **Answer: C)** 7