

※ You will receive 1.5 points for each correct answer for problems 1 to 30.

1. Solve the fraction into its simplest form.

$$\frac{54}{78}$$

- Ⓐ $\frac{2}{3}$
- Ⓑ $\frac{7}{9}$
- Ⓒ $\frac{9}{13}$
- Ⓓ $\frac{6}{17}$
- Ⓔ $\frac{11}{18}$

2. Solve the fraction into its simplest form.

$$\frac{68}{153}$$

- Ⓐ $\frac{2}{9}$
- Ⓑ $\frac{1}{3}$
- Ⓒ $\frac{7}{18}$
- Ⓓ $\frac{3}{7}$
- Ⓔ $\frac{4}{9}$

3. Calculate the answer.

$$3\frac{1}{12} + 4\frac{1}{4}$$

- Ⓐ $7\frac{1}{12}$
- Ⓑ $7\frac{1}{8}$
- Ⓒ $7\frac{1}{6}$
- Ⓓ $7\frac{1}{4}$
- Ⓔ $7\frac{1}{3}$

4. Calculate the answer.

$$2\frac{5}{6} + 3\frac{7}{15}$$

- Ⓐ $5\frac{4}{15}$
- Ⓑ $5\frac{3}{10}$
- Ⓒ $6\frac{4}{15}$
- Ⓓ $6\frac{3}{10}$
- Ⓔ $6\frac{1}{3}$

5. Calculate the answer.

$$5\frac{1}{4} - 2\frac{5}{12}$$

- Ⓐ $2\frac{2}{3}$
- Ⓑ $2\frac{3}{4}$
- Ⓒ $2\frac{5}{6}$
- Ⓓ $3\frac{1}{12}$
- Ⓔ $3\frac{1}{6}$

6. Calculate the answer.

$$8\frac{3}{16} - 5\frac{7}{10}$$

- Ⓐ $2\frac{19}{40}$
- Ⓑ $2\frac{39}{80}$
- Ⓒ $2\frac{41}{80}$
- Ⓓ $3\frac{19}{40}$
- Ⓔ $3\frac{39}{80}$

7. Calculate the answer.

$$\frac{1}{2} + \left(\frac{3}{4} - \frac{2}{5}\right)$$

- Ⓐ $\frac{17}{20}$
- Ⓑ $\frac{39}{40}$
- Ⓒ $1\frac{1}{40}$
- Ⓓ $1\frac{1}{20}$
- Ⓔ $1\frac{3}{40}$

8. Calculate the answer.

$$2\frac{3}{5} - 1\frac{13}{15} + 1\frac{2}{3}$$

- Ⓐ $1\frac{3}{10}$
- Ⓑ $1\frac{4}{5}$
- Ⓒ $2\frac{11}{30}$
- Ⓓ $2\frac{2}{5}$
- Ⓔ $2\frac{13}{30}$

9. Calculate the answer.

$$1\frac{5}{9} \times 1\frac{3}{7}$$

- Ⓐ $2\frac{13}{63}$
- Ⓑ $2\frac{2}{9}$
- Ⓒ $2\frac{5}{21}$
- Ⓓ $3\frac{16}{63}$
- Ⓔ $3\frac{7}{9}$

10. Calculate the answer.

$$0.48 \times 5\frac{5}{8}$$

- Ⓐ $1\frac{29}{40}$
- Ⓑ $1\frac{3}{4}$
- Ⓒ $2\frac{13}{20}$
- Ⓓ $2\frac{27}{40}$
- Ⓔ $2\frac{7}{10}$

11. Calculate the answer.

$$2\frac{4}{5} \times \frac{5}{6} \times 1\frac{2}{7}$$

- Ⓐ 3
- Ⓑ $3\frac{1}{6}$
- Ⓒ $3\frac{1}{5}$
- Ⓓ $3\frac{1}{4}$
- Ⓔ $3\frac{1}{3}$

12. Calculate the answer.

$$0.72 \times \frac{3}{4} \times \frac{5}{9}$$

- Ⓐ $\frac{1}{4}$
- Ⓑ $\frac{2}{9}$
- Ⓒ $\frac{3}{10}$
- Ⓓ $\frac{7}{18}$
- Ⓔ $\frac{13}{36}$

13. Calculate the answer.

$$5\frac{5}{6} \div \frac{7}{16}$$

- Ⓐ $9\frac{1}{9}$
- Ⓑ $10\frac{1}{8}$
- Ⓒ $11\frac{1}{6}$
- Ⓓ $12\frac{1}{4}$
- Ⓔ $13\frac{1}{3}$

14. Calculate the answer.

$$4\frac{7}{8} \div 2.6$$

- Ⓐ $\frac{7}{8}$
- Ⓑ $1\frac{1}{8}$
- Ⓒ $1\frac{7}{8}$
- Ⓓ $2\frac{1}{8}$
- Ⓔ $2\frac{7}{8}$

15. Calculate the answer.

$$4\frac{8}{9} \div 1\frac{4}{7}$$

- Ⓐ $3\frac{1}{12}$
- Ⓑ $3\frac{1}{9}$
- Ⓒ $3\frac{1}{7}$
- Ⓓ $4\frac{1}{9}$
- Ⓔ $4\frac{1}{7}$

16. Calculate the answer.

$$\frac{7}{8} \div 1\frac{5}{6} \div 2\frac{11}{12}$$

- Ⓐ $\frac{7}{50}$
- Ⓑ $\frac{9}{50}$
- Ⓒ $\frac{7}{55}$
- Ⓓ $\frac{8}{55}$
- Ⓔ $\frac{9}{55}$

17. Calculate the answer.

$$1\frac{4}{5} \div 5.4 \times 2\frac{1}{7}$$

- Ⓐ $\frac{5}{7}$
- Ⓑ $\frac{6}{7}$
- Ⓒ $1\frac{1}{7}$
- Ⓓ $1\frac{2}{7}$
- Ⓔ $1\frac{3}{7}$

18. Calculate the answer.

$$2\frac{2}{3} \times 4\frac{1}{6} \div 2\frac{2}{9}$$

- Ⓐ $4\frac{1}{9}$
- Ⓑ $4\frac{1}{6}$
- Ⓒ $4\frac{1}{3}$
- Ⓓ 5
- Ⓔ $5\frac{1}{18}$

19. Calculate the answer.

$$\left(1\frac{3}{8} - \frac{3}{4}\right) \times 2\frac{2}{5} \div 1\frac{1}{11}$$

- Ⓐ $1\frac{1}{4}$
- Ⓑ $1\frac{3}{8}$
- Ⓒ $1\frac{1}{2}$
- Ⓓ $2\frac{1}{4}$
- Ⓔ $2\frac{3}{8}$

20. Calculate the answer.

$$\begin{array}{r} 3.28 \\ \times 17 \\ \hline \end{array}$$

- Ⓐ 54.46
- Ⓑ 54.86
- Ⓒ 55.76
- Ⓓ 55.96
- Ⓔ 56.16

21. Calculate the answer.

$$\begin{array}{r} 7.4 \\ \times 3.7 \\ \hline \end{array}$$

- Ⓐ 23.78
- Ⓑ 25.18
- Ⓒ 27.38
- Ⓓ 28.98
- Ⓔ 30.08

22. Calculate the answer.

$$\begin{array}{r} 8.4 \\ \times 0.16 \\ \hline \end{array}$$

- Ⓐ 1.344
- Ⓑ 1.674
- Ⓒ 2.004
- Ⓓ 2.324
- Ⓔ 2.644

23. Calculate the answer.

$$3.8 \overline{) 3.71}$$

- Ⓐ 0.95 0.005
- Ⓑ 0.96 0.037
- Ⓒ 0.97 0.024
- Ⓓ 0.98 0.026
- Ⓔ 0.99 0.011

24. Calculate the answer.

$$9.3 \overline{) 68.94}$$

- Ⓐ 7.38 0.061
- Ⓑ 7.39 0.019
- Ⓒ 7.39 0.087
- Ⓓ 7.41 0.013
- Ⓔ 7.41 0.027

25. Solve the equation.

$$\left(x \div \frac{5}{9}\right) \times \frac{4}{15} = 4\frac{4}{5}$$

- Ⓐ 7
- Ⓑ 8
- Ⓒ 9
- Ⓓ 10
- Ⓔ 11

26. Find the value of x .

$$2\frac{1}{10} : x = 1.6 : 4\frac{4}{7}$$

- Ⓐ 4
- Ⓑ 5
- Ⓒ 6
- Ⓓ 7
- Ⓔ 8

27. Calculate the answer.

$$-6 + (-8 - (4 - 11)) - 13$$

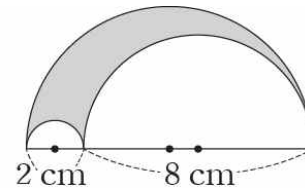
- Ⓐ -20
- Ⓑ -10
- Ⓒ -5
- Ⓓ 10
- Ⓔ 20

28. Calculate the answer.

$$3\frac{1}{8} \div \left(-1\frac{5}{6}\right) \times (-2.2) \div 4 \times 2\frac{2}{15}$$

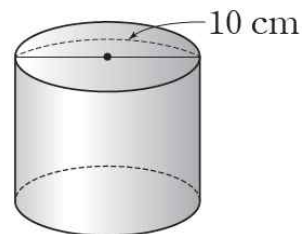
- Ⓐ -2
- Ⓑ -1
- Ⓒ 1
- Ⓓ 2
- Ⓔ 3

29. What is the perimeter of the shaded area? ($\pi = 3.14$)



- Ⓐ 15.7 cm
- Ⓑ 18.2 cm
- Ⓒ 21.6 cm
- Ⓓ 26.5 cm
- Ⓔ 31.4 cm

30. Find the height of the cylinder with the given surface area. ($\pi = 3.14$)



$$\text{Surface area} = 408.2 \text{ cm}^2$$

- Ⓐ 5 cm
- Ⓑ 6 cm
- Ⓒ 7 cm
- Ⓓ 8 cm
- Ⓔ 9 cm

※ You will receive 2.0 points for each correct answer for problems 31 to 40.

- 31.** Tyler is going to jog every four days starting on January 4th and cycle every six days starting on January 6th. What is the total number of days when he does both jogging and cycling on the same day this year?

_____ days

- 32.** Of the 224 students in a school, $\frac{2}{7}$ can swim. $\frac{3}{5}$ of the school's non-swimmers are boys. How many girls can't swim in total?

_____ girls

- 33.** Richard has a garden with an area of 624m^2 . When he tries to plant flowers in 30% of the garden area and trees in $\frac{2}{15}$ of the garden area, how much greater is the area where he plants flowers than the area where he plants trees?

_____ m^2

- 34.** Robin has a car that can travel $15\frac{5}{8}$ km with $1\frac{1}{4}$ L of gas. He's going to travel $362\frac{1}{2}$ km from his home in this car. How many liters of gas does he need?

_____ L

- 35.** Of the time Iris was in school today, $\frac{2}{3}$ was in class and $\frac{5}{36}$ was in recess. If the rest of the time was lunch time and lunch time was 70 minutes, how many hours was she in school today?

_____ hours

- 36.** Some tennis balls and some baseballs are mixed in a box. If the ratio of tennis balls to baseballs is $5 : 3$, and the total number of balls is 96, how many more tennis balls are there than baseballs?

- 37.** A snail travels 0.2m in $\frac{2}{5}$ hours. How many centimeters does this snail travel in 54 minutes?

_____ cm

- 38.** There are $2\frac{2}{3}$ L of blueberry milk. The milk in this drink makes up 36% of the total. How many milliliters of milk are in the blueberry milk?

_____ mL

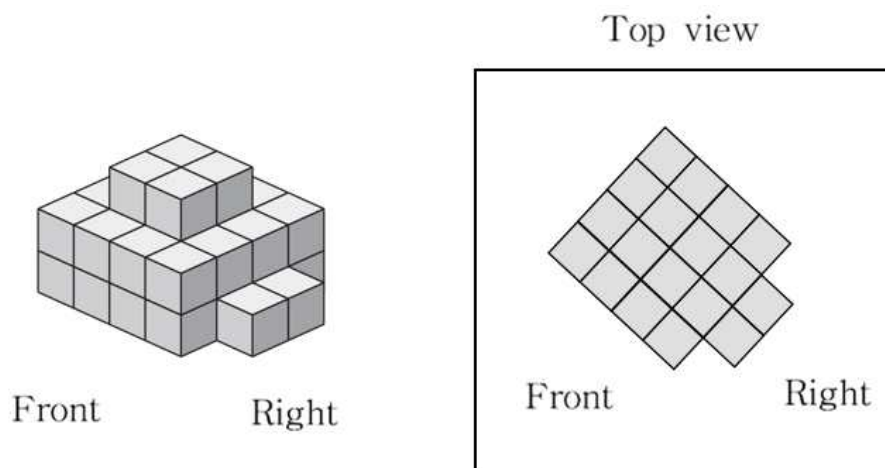
- 39.** Winston has 15 more greeting cards than Kayla. When Winston and Kayla have 73 greeting cards altogether, how many greeting cards does Winston have?

_____ greeting cards

- 40.** There is a rectangular prism with a length of 7cm, a width of 8cm, and a volume of 1008cm^3 . What is the surface area of this rectangular prism?

_____ cm^2

- 41.** A set of wooden blocks, as shown in the picture, has been painted on all sides including the bottom. If the shape is separated into individual blocks, how many of the individual blocks have no painted faces? [2.3 points]



Answer : _____

- 42.** There are 11 \$1 bills, 5 \$5 bills, and 3 \$10 bills. How many possible ways are there to make a payment of exactly \$36? [3.3 points]

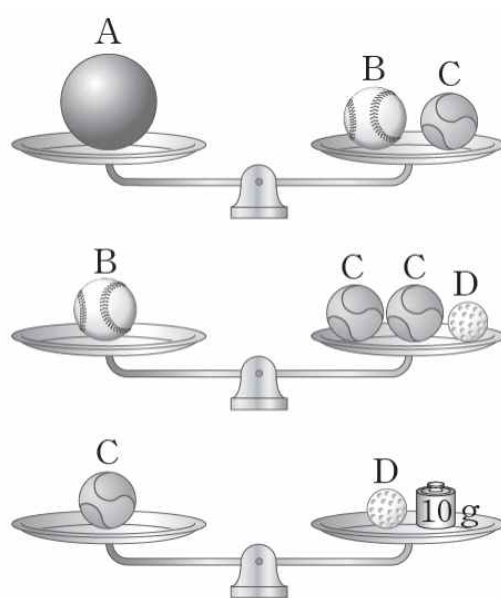
Answer : _____ ways

43. Put one +, −, and × in each $\square$ and find the sum of the maximum and minimum values of the resulting equations. [3.3 points]

$$6 \square 3 \square 2 \square 3$$

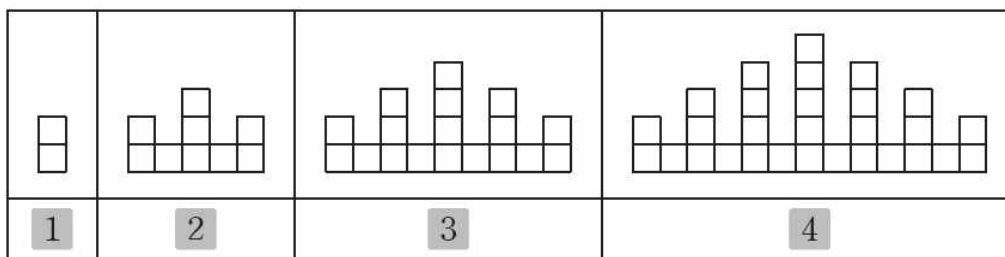
Answer : _____

44. The following balances are all level. If ball A weighs 210g, what is the weight of ball B? [3.3 points]



Answer : _____ g

45. The picture below follows an increasing pattern and the figure numbers indicate the order. How many squares($\square$) would there be in the 8th figure? [4.3 points]



Answer : _____ squares

46. The A, B, and C represent three different numbers from one to nine. Find the value of $A \times B \times C$. [4.3 points]

$$\begin{array}{r}
 B \\
 \hline
 A \overline{) B B} \\
 B \\
 \hline
 A \\
 A \\
 \hline
 0
 \end{array}$$

Answer : _____

47. There is a large container of water and two beakers that can hold 5L and 7L. Let's say that pouring water from the large container into a beaker, transferring water from one beaker to another, and discarding water from a beaker are one step each. How many steps do I need at minimum to make 1L using the two beakers? [4.3 points]

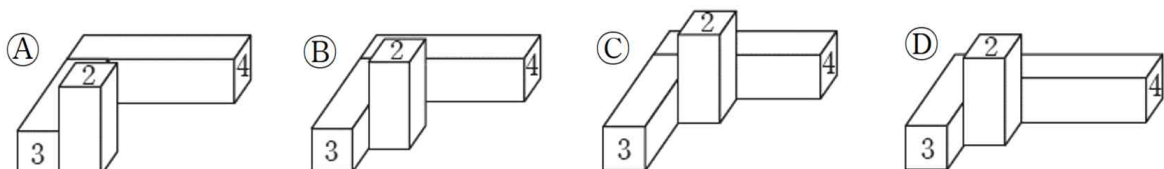
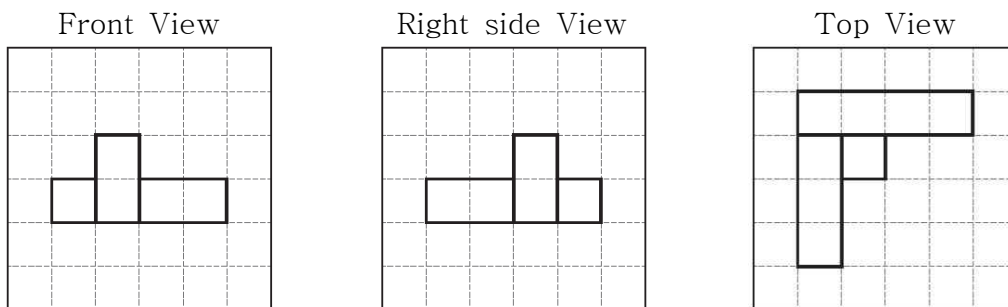
Example: How to make 2L.

1. Fill a 7L beaker with water.
 2. Transfer the water from the 7L beaker to the 5L beaker.
- The remaining water in the 7L beaker is 2L, so 2 steps are required.



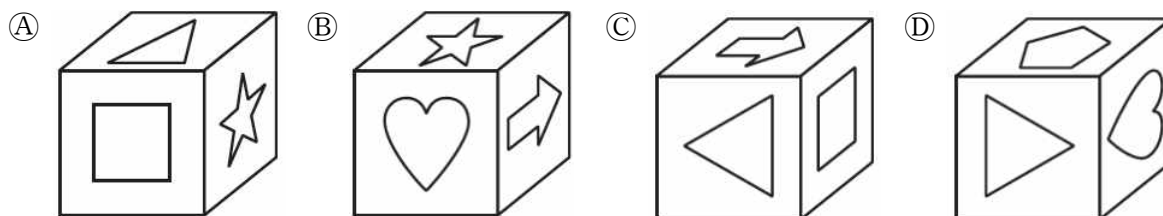
Answer : _____ steps

48. The front, side, and top views of a set of blocks are given. Find the correct set of blocks. [2.3 points]



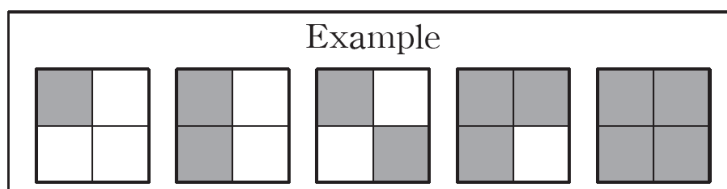
Answer : _____

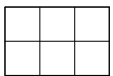
49. The following images show the various sides of a cube. Choose the one cube that is different from the others. [3.3 points]



Answer : _____

50. The following example shows that there are 5 ways to color each  to represent a  differently. The shapes are considered the same with rotation or symmetry.



Find the number of ways to color each  to represent  differently. [4.3 points]

- (A) 20 (B) 21 (C) 22 (D) 23

Answer : _____