

※ You can receive 1.5 points each for problems number 1 to 30.

In problems 1-8, solve each problem into its simplest form as a proper fraction or a mixed number. Write the numerator of the fraction as your answer. (For example, if the answer is $3\frac{10}{6}$, make $4\frac{2}{3}$ and write the final answer as 2)

1. $5\frac{7}{8} + 1\frac{7}{24}$

2. $6\frac{4}{15} - 3\frac{5}{9}$

3. $4\frac{1}{6} \times 2\frac{3}{5}$

4. $0.75 \times 2\frac{2}{9}$

5. $2\frac{1}{12} \div 1\frac{5}{6}$

6. $3\frac{1}{9} \div 2\frac{1}{5} \times 2\frac{3}{4}$

$$7. 3\frac{3}{8} \div 1.08 - \frac{5}{8}$$

$$8. 2\frac{7}{10} - \left(9 - 10 \div \left(\frac{5}{6} + \frac{5}{9}\right)\right)$$

In problems 9-12, solve each question and write the decimal part as your answer. (For example, if the answer is 18.2 or 18.20, then write the final answer as 2. If the answer is 2.54 or 2.054, then write the final answer as 54.)

$$9. \begin{array}{r} 2.73 \\ \times \quad 6 \\ \hline \end{array}$$

$$10. \begin{array}{r} 4.7 \\ \times 6.4 \\ \hline \end{array}$$

$$11. \begin{array}{r} 35.9 \\ \times 7.2 \\ \hline \end{array}$$

$$12. \begin{array}{r} 5.46 \\ \times 0.92 \\ \hline \end{array}$$

In problems 13-17, calculate the quotient up to the hundredths place and write the remainder. Then, add the quotient and the remainder. Write the decimal part of this number as your answer. (For example, if the quotient is 2.56 and the remainder is 0.004, calculate $2.56 + 0.004 = 2.564$, and write the final answer as 564.)

13.

$$8 \overline{) 45.1}$$

14.

$$4.3 \overline{) 65.1}$$

15.

$$6.4 \overline{) 25.86}$$

16.

$$8.3 \overline{) 95.62}$$

17.

$$72.8 \overline{) 77.17}$$

In problems 18-22, solve each equation.

18. $(x \times 6) \div 4 = 24$

19. $(x - 3.45) + 1\frac{3}{5} = 1\frac{3}{20}$

$$20. \left(x \div \frac{8}{15} \right) - 5.3 = 2\frac{1}{5}$$

$$21. \left(x \div 2\frac{1}{6} \right) \div 1.5 = 12$$

$$22. 2\frac{1}{8}x + 4\frac{1}{6} = \frac{3}{8}x - 6\frac{1}{3}$$

In problems 23-25, find the value of x .

$$23. x : 8\frac{4}{5} = \frac{10}{11} : 2$$

$$24. 4\frac{1}{6} : x = 3\frac{1}{3} : 4$$

$$25. 1\frac{3}{8} : 6 = 2\frac{3}{4} : x$$

In problem 26, express the ratio in the simplest natural number form, and then add all three numbers. (For example, if the ratio is $7:1:3$, then write as $7+1+3=11$.)

26. $4\frac{1}{6} : 1\frac{1}{4} : 1.5$

In problems 27-28, solve each question.

27. $-\frac{3}{10} + (3 - (6 + (4 - 1.3)))$

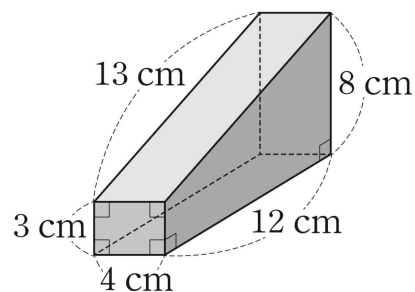
28. $1.96 \div 1\frac{7}{9} \times \left(-5\frac{5}{7}\right) \div 0.3$

29. Find the value of a if the solutions

to $\frac{1}{4}x + 2 = 5\frac{1}{2} - \frac{1}{3}x$ and

$\frac{a-x}{4} = \frac{x+9}{5}$ are equal.

30. Calculate the surface area.



cm^2

※ You can receive 2.0 points each for problems number 31 to 40.

- 31.** There are sparrows and pigeons in a park. $\frac{5}{8}$ of all birds in the park are sparrows, and there are 12 pigeons. How many birds are there in the park?

_____ birds

- 32.** There is a cup of salt water with a salt concentration of 3 %. When the amount of salt is $8\frac{1}{4}$ g, what is the amount of salt water?

_____ g

- 33.** A 12 cm stick weighs 75 g. How much does the 1 meter stick weigh, if the diameters of both sticks are the same?

_____ g

- 34.** George plans to pack and sell 0.3 kg each of $7\frac{2}{7}$ kg of almonds.

How many packs of almonds can he sell?

_____ packs

- 35.** Stephanie trained for 12 hours in one day. She spent $\frac{2}{5}$ of her training time walking. What is the total time she walked? If the time is A hours and B minutes, write A + B.

- 36.** Taylor's bouquet has roses, freesias, and mistflowers. The ratio of roses, freesias, and mistflowers is 1 : 2 : 7. If there are 35 mistflowers, how many flowers are in the bouquet?

_____ flowers

- 37.** Luna and Ethan started with the same number of beads. Luna gave Ethan a quarter of her beads, and Ethan bought 9 more beads. Now, Ethan's beads are twice as many as Luna's: how many beads did Luna first have?

_____ beads

- 38.** Elena has several rectangular tiles measuring 15 cm by 24 cm. She is going to put tiles side by side to construct a square. What is the least number of tiles she must use?

_____ tiles

- 39.** There is a cylindrical bottle with a volume of 83 cm^3 . What is the volume of another cylindrical bottle whose radius is twice the radius of this bottle and whose height is three times the height of this bottle?

_____ cm^3

- 40.** Joseph bought 12 balls in total. Baseballs cost \$2 each and tennis balls cost \$1 each. How many baseballs did he buy if he used \$20?

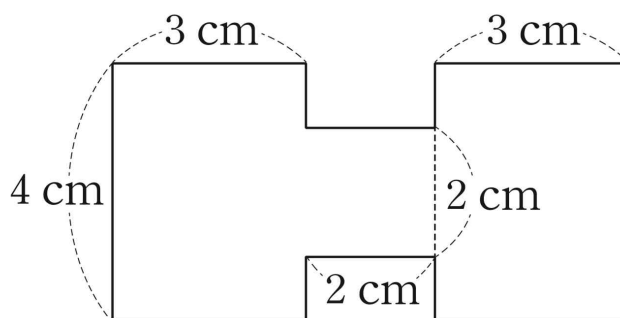
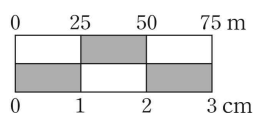
_____ baseballs

41. The following shows a rule for finding the sum of numbers. What number goes in $\blacksquare$? [2.3 points]

$$\begin{aligned}
 1+4+7+10+13+16+19+22 &= 23 \times 4 \\
 11+14+17+20+23+26+29+32 &= 43 \times 4 \\
 21+24+27+30+33+36+39+42 &= 63 \times 4 \\
 &\vdots \\
 91+94+97+100+103+106+109+112 &= \triangle \times \bigcirc = \blacksquare
 \end{aligned}$$

Answer : _____

42. A figure is drawn according to the scale shown. Find the perimeter of the original figure in meters. [2.3 points]



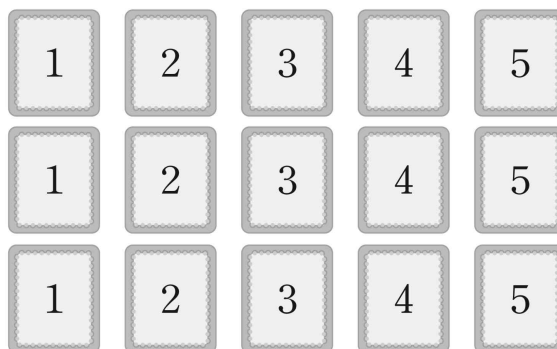
Answer : _____ m

- 43.** Find the sum of the denominator and the numerator of the 10th fraction when the given fractions follow a certain rule. [3.3 points]

$\frac{1}{1}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{7}{5}$	$\frac{9}{8}$	$\frac{11}{13}$		
(1)	(2)	(3)	(4)	(5)	(6)	...	(10)

Answer : _____

- 44.** There are three cards for each number 1, 2, 3, 4, and 5. How many 3-digit numbers can be made where the sum of the three digits is 11? [3.3 points]



Answer : _____

45. Based on the descriptions A, B, and C, see if the following statements can be known to be true. How many can be known to be true? [3.3 points]

Descriptions

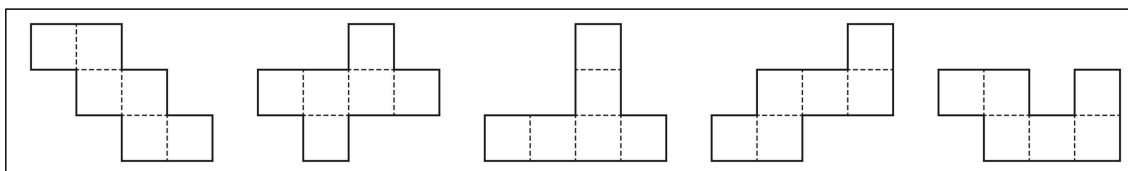
- A. Every bicycle has wheels.
B. There are some one-seat bicycles and some two-seat bicycles.
C. Kelly is riding a bicycle with her friend who is sitting on the back seat.

Statements

1. Kelly is able to ride a bicycle.
2. Only one person can ride on Kelly's bicycle.
3. Kelly's bicycle is fast.
4. There are some bicycles that have no wheels.
5. Total number of people who can ride on 5 bicycles is 10.
6. Every vehicle that has wheels is called a bicycle.

Answer : _____

46. How many of these nets can be folded to make a cube? [3.3 points]



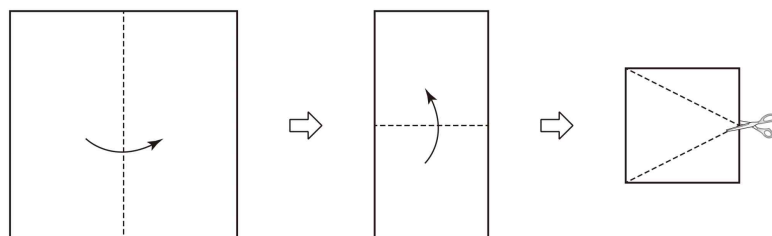
Answer : _____ nets

47. Using at least one of the following three kinds of bills, you are going to pay \$45. You are allowed to use the same bills more than once. How many different ways can you pay \$45? [4.3 points]



Answer : _____ ways

48. If the colored paper is folded as shown and cut along the dotted line, how many triangles are made? [4.3 points]

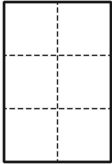


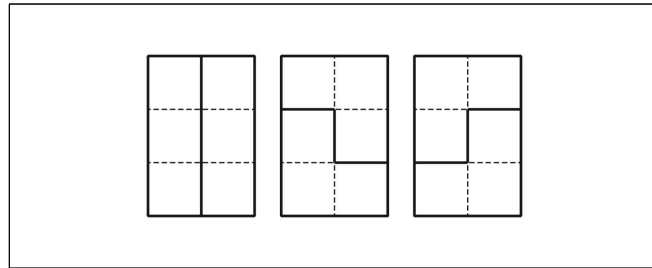
Answer : _____ triangles

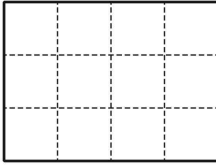
49. The following boxes show the division process of the 4-digit number ABBA by the 2-digit number CC. The numbers of A, B, and C are all different and C is not zero. Find the value of $A + B + C$. [4.3 points]

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

Answer : _____

50. This  shaped land is made by 6 joined squares. There are three ways to divide the land into two equal size and equal shaped pieces.



The  shaped land is made by 12 joined squares. How many ways are there to divide this land into two equal size and shaped pieces? [4.3 points]

Answer : _____ ways