

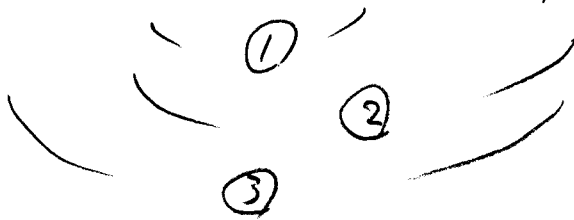
$$\begin{aligned}
 \text{① (1)} & \quad (\underline{192 \times 5} - \underline{384 \times 2} + \underline{96 \times 4}) \div 27 \\
 & = (\underline{96 \times 2 \times 5} - \underline{96 \times 4 \times 2} + \underline{96 \times 4}) \div 27 \\
 & = 96 \times (10 - 8 + 4) \div 27 \\
 & = \frac{\overset{32}{\cancel{46} \times \cancel{6}^2}}{\underset{83}{\cancel{27}}} = \frac{64}{3} = \underline{\underline{21\frac{1}{3}}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(2)} & \quad \frac{4 \times 3}{9 \times 5 \times 2} - \frac{3 \times 2}{9 \times 7 \times 4} + \frac{5 \times 2}{7 \times 5 \times 4} \\
 & = \frac{7 \times 2 \times 4 \times 3}{9 \times 7 \times 5 \times 4} - \frac{5 \times 3 \times 2}{9 \times 7 \times 5 \times 4} + \frac{7 \times 5 \times 2}{9 \times 7 \times 5 \times 4} \\
 & = \frac{168 - 30 + 70}{9 \times 7 \times 5 \times 4} = \frac{\overset{57}{\cancel{228}} \overset{19}{1}}{\underset{3}{\cancel{9 \times 7 \times 5 \times 4}} \underset{1}{1}} = \underline{\underline{\frac{19}{105}}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(3)} & \quad (9 - 3\frac{4}{7} \div 0.75 + 2\frac{2}{3}) \div \frac{1}{21} \\
 & = (9 - \frac{25}{7} \times \frac{4}{3} + \frac{8}{3}) \times 21 \\
 & = \underset{1}{9} \times \underset{1}{21} - \frac{25}{\underset{1}{7}} \times \frac{4}{\underset{1}{3}} \times \underset{1}{\cancel{21}^7} + \frac{8}{\underset{1}{3}} \times \underset{1}{\cancel{21}^7} \\
 & = 189 - 100 + 56 = \underline{\underline{145}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(4)} & \quad \underline{6 \times 5 \times 16} + \underline{4 \times 5 \times 1.6} - \underline{5 \times 0.5 \times 160} \\
 & = \underline{6 \times 5 \times 16} + \underline{4 \times 5 \times 0.1 \times 16} - \underline{5 \times 0.5 \times 10 \times 16} \\
 & = 16 \times (6 \times 5 + 4 \times 5 \times 0.1 - 5 \times 0.5 \times 10) \\
 & = 16 \times (30 + 2 - 25) \\
 & = 16 \times 7 = \underline{\underline{112}}
 \end{aligned}$$

$$\boxed{2} \text{ (1) } \frac{33}{7} \times \left\{ \underbrace{\left(\frac{1}{4} - \frac{1}{5} \right)}_{\frac{1}{20}} \times \square - \underbrace{\frac{7}{9} \div \frac{2}{3}}_{\frac{7}{3} \times \frac{3}{2} = \frac{7}{2}} \right\} + \frac{3}{7} = 2$$



$$\textcircled{3} + \frac{3}{7} = 2 \quad \textcircled{3} = 2 - \frac{3}{7} = 1\frac{4}{7} = \frac{11}{7}$$

$$\frac{33}{7} \times \textcircled{2} = \frac{11}{7} \quad \textcircled{2} = \frac{11}{7} \div \frac{33}{7} = \frac{11}{7} \times \frac{7}{33} = \frac{1}{3}$$

$$\textcircled{1} - \frac{7}{15} = \frac{1}{3} \quad \textcircled{1} = \frac{7}{15} + \frac{1}{3} = \frac{7}{15} + \frac{5}{15} = \frac{12}{15} = \frac{4}{5}$$

$$\frac{1}{20} \times \square = \frac{4}{5} \quad \square = \frac{4}{5} \div \frac{1}{20} = \frac{4}{5} \times \frac{20}{1} = \underline{\underline{16}}$$

$$(2) \quad \frac{4}{5} < \frac{89}{\square} < \frac{9}{11}$$

$$\frac{4}{5} = \frac{89}{\square} \quad \times \frac{89}{89}$$

$$\frac{9}{11} = \frac{89}{\square} \quad \times \frac{89}{89}$$

$$5 \times \frac{89}{4} = \frac{445}{4} = 111\frac{1}{4}$$

$$11 \times \frac{89}{9} = \frac{979}{9} = 108\frac{7}{9}$$

$$108\frac{7}{9} < \square < 111\frac{1}{4}$$

3つあるとこれOK

A 109, 110, 111

$$(3) \begin{vmatrix} 11 & 12 \\ 13 & \square \end{vmatrix} = 42$$

$$11 \times \square - 12 \times 13 = 42.$$

156

$$11 \times \square = 156 + 42 = 198$$

$$\square = 198 \div 11 = 18$$

A. 18

$$(4) \begin{array}{c} \text{千} \quad \text{百} \quad + \quad - \\ 2 \quad 0 \quad \begin{array}{l} \swarrow 1-3 \\ \searrow 3-1 \end{array} \\ \begin{array}{l} \swarrow 1 \quad \nwarrow \\ \searrow 3 \quad \swarrow \end{array} \end{array} \left. \vphantom{\begin{array}{c} \text{千} \quad \text{百} \quad + \quad - \\ 2 \quad 0 \quad \begin{array}{l} \swarrow 1-3 \\ \searrow 3-1 \end{array} \\ \begin{array}{l} \swarrow 1 \quad \nwarrow \\ \searrow 3 \quad \swarrow \end{array} } \right\} \begin{array}{l} 3 \times 2 \times 1 \\ = 6 \end{array}$$

千の位が3の場合も6通り

$$6 \times 2 = 12$$

A. 12

(5) 立方体の1辺を1とする

$$\text{体積} = 1 \times 1 \times 1 = 1$$

$$\text{たて} \frac{1}{5} \text{短く} \rightarrow \frac{4}{5} \quad \text{よこ} \frac{1}{4} \text{短く} \rightarrow \frac{3}{4}$$

$$\text{たて} \times \text{よこ} \times \text{高さ} \\ \frac{4}{5} \times \frac{3}{4} \times \square = 1$$

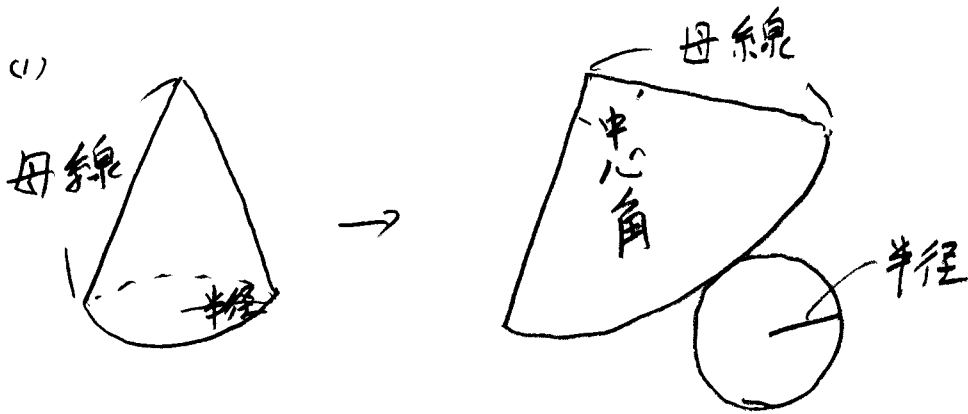
$$\square = 1 \div \left(\frac{4}{5} \times \frac{3}{4} \right)$$

$$= 1 \div \frac{3}{5}$$

$$= 1 \times \frac{5}{3} = \frac{5}{3}$$

A. $1\frac{2}{3}$ 倍

3 (1)



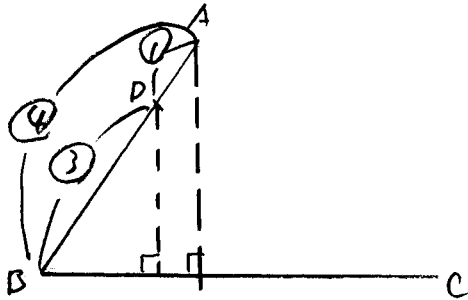
ポイント: $\frac{\text{半径}}{\text{母線}} = \frac{\text{中心角}}{360}$ (暗記)

$$\frac{8}{40} = \frac{x}{360}$$

$$x = 360 \times \frac{8}{40} = 72$$

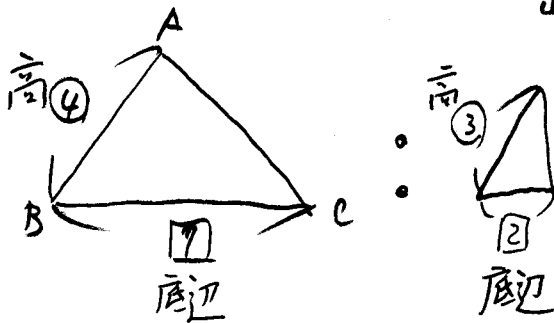
A. 72

(2)



ポイント: 左図のように $AB:DB=4:3$ となるがこれは本来高さではない。しかし、BCに直角に高さを書くと相似図形となり $4:3$ 。

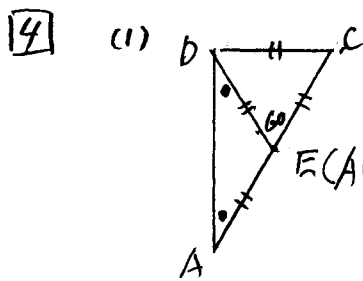
このような時は高さの比として使うことができる。



$$= 4 \times 7 \times \frac{1}{2} : 3 \times 2 \times \frac{1}{2}$$

$$= 14 : 3$$

A. $\frac{3}{14}$



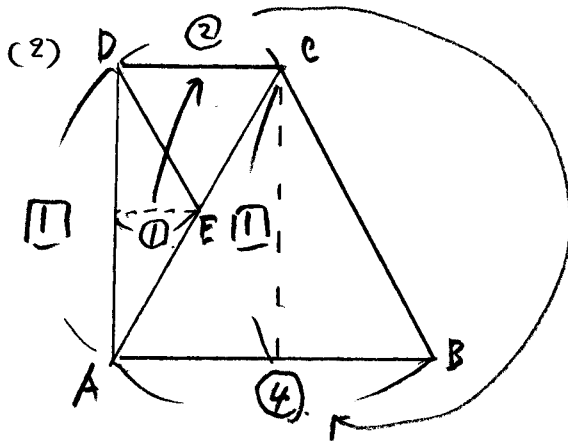
$\triangle AED$ は二等辺三角形なので・印の角は等しい

E (ACの中点)

また角DECは $\triangle AED$ の外角なので

$$60 \div 2 = 30$$

A. 30°



左図の長さの比を実際の長さとして考え面積の比を計算

四角形ABCD : $\triangle AED$

$$= (② + ④) \times \text{高さ} \times \frac{1}{2} : \text{高さ} \times ① \times \frac{1}{2}$$

$$= 6 : 1$$

A. 6 : 1

⑤ (1) 黒石の数 = 段数の数 - 両サイドの白

$$= 20 - 2 = 18$$

A. 18個

(2) 50段目 = $50 - 2 = 48$ 個

$$1 + 2 + \dots + 48 = (1 + 48) \times 48 \times \frac{1}{2}$$

$$= 1176$$

A. 1176個

ポイント: 等しい数ずつ増える数列の和は

(初めの数 + 最後の数) \times 数の個数 $\times \frac{1}{2}$ で求められる。
(上の式なら48個)

(3) $(1 + \square) \times \square \times \frac{1}{2} = 1326$

$$(1 + \square) \times \square = 1326 \times 2 = 2652$$

1つちがいの数の積が $2652 = 51 \times 52$

最後の数
 $\begin{matrix} 51 & \times & 52 \\ \uparrow & & \uparrow \\ 3 \times 17 & & 2 \times 2 \times 13 \end{matrix}$

④

$$\begin{array}{r} 2 \overline{) 2652} \\ 2 \overline{) 1326} \\ 3 \overline{) 663} \\ 13 \overline{) 221} \\ \quad 17 \end{array}$$
 素数とさる

A. 51段目

16 (1) 1割引で 8010円

$$\square \times (1 - 0.1) = 8010$$

$$\square = 8010 \div 0.9 = 8900$$

A 8900円

(2) 昨年 $A \times 3 = B \times 2 \rightarrow A : B = 2 : 3$

A 1個 ② と 3個 B 1個 ③

$$A 6個 B 4個で 6000円 \rightarrow \underbrace{\textcircled{2} \times 6 + \textcircled{3} \times 4}_{\textcircled{24}} = 6000$$

$$6000 \div 24 = 250円 \dots \textcircled{1}$$

$$A = \textcircled{2} = 250 \times 2 = 500円$$

$$B = \textcircled{3} = 250 \times 3 = 750円$$

A 750円

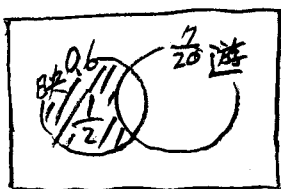
(3) 今年 A $500 \times (1 + 0.1) = 550円$
B $750 \times (1 + 0.2) = 900円$

$$8900 - \underbrace{550 \times (1 - 0.1)}_{0.9} \times 8 = 4050円 \dots B$$

$$4050 \div (900 \times 0.9) = 5$$

A 5個

17 (1)



$$0.6 - \frac{1}{2} = 0.1$$

A 10%

(2)

$$\text{Venn diagram} = \frac{1}{2} + \frac{7}{20} = \frac{17}{20} \dots \text{どちらかにいふ人}$$

$$1 - \frac{17}{20} = \frac{3}{20} \dots \text{どちらにもいふな人}$$

$$6 \div \frac{3}{20} = 40$$

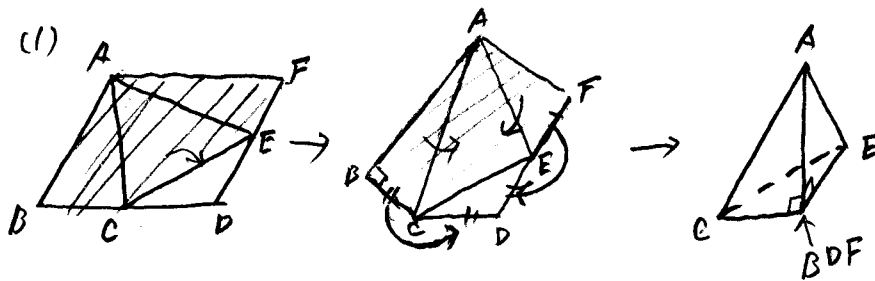
A 40人

(3)

$$\text{Venn diagram} = \frac{7}{20} - 0.1 = \frac{5}{20} = \frac{1}{4} \quad 40 \times \frac{1}{4} = 10$$

A 10人

8 (1)



ABが高さ

$A, 18 \text{ cm}$

(2)

$$9 \times 9 \times \frac{1}{2} \times \frac{63}{18} \times \frac{1}{3} = 243$$

$A 243 \text{ cm}^3$

(3)

$$\begin{aligned}
 &= \underbrace{18 \times 18}_{24} - \underbrace{18 \times 9 \times \frac{1}{2}}_{162} \times 2 - \underbrace{9 \times 9 \times \frac{1}{2}}_{40.5} \\
 &= 121.5 \text{ cm}^2
 \end{aligned}$$

底面積 \times 高さ $\times \frac{1}{3} = \text{体積}$

$121.5 \times \text{高さ} \times \frac{1}{3} = 243$

高さ $= 243 \times 3 \div 121.5 = 6$

$A 6 \text{ cm}$