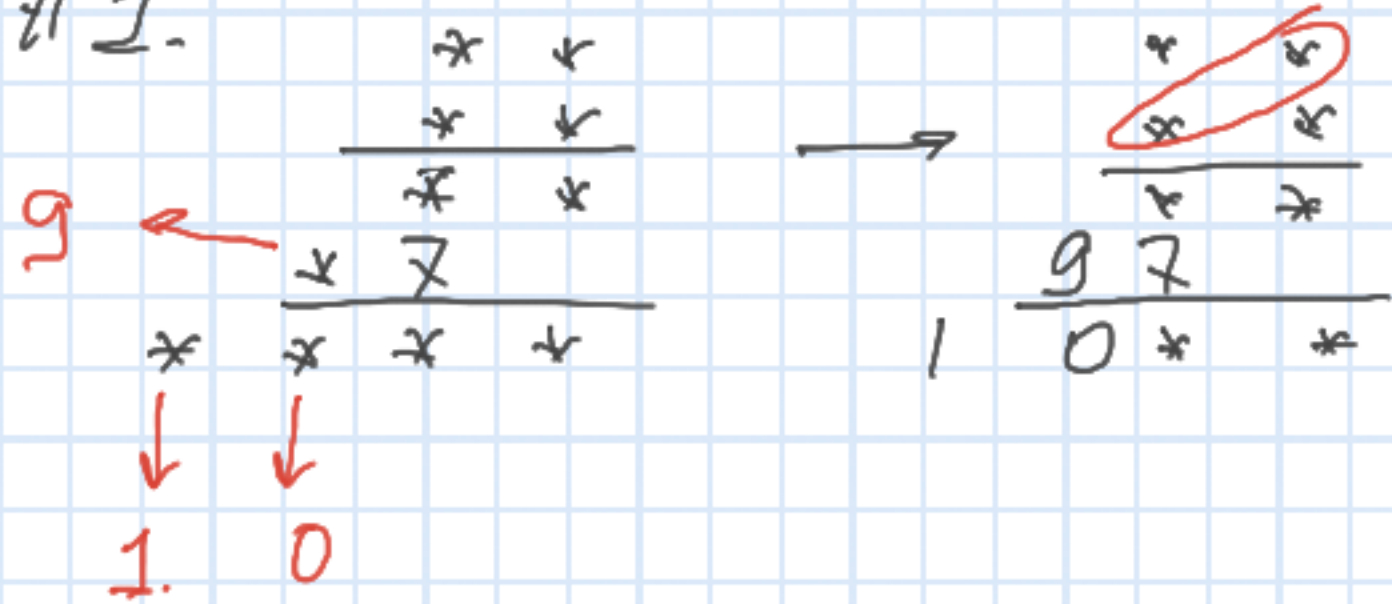


HW 5.

#1.



should be 3 and 9
or 7 and 1.

3 and 9 can't be

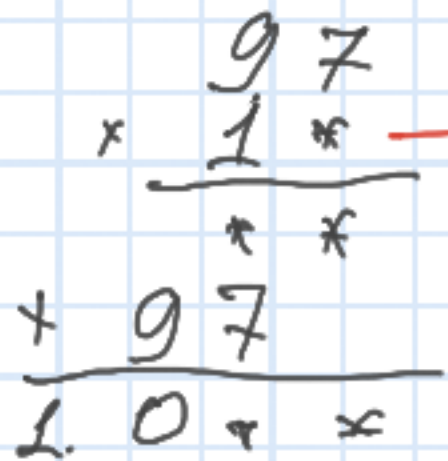
$$*9 \cdot 3 \text{ or } *3 \cdot 9 = 97.$$

97 is not divisible by 3 or 9.

$$*1 \cdot 7 \text{ or } *7 \cdot 1 = 97.$$

$$97 \cdot 1 = 97.$$

$$\underline{13} \cdot 7 = 97. \rightarrow \text{last digit 3, not 1.}$$

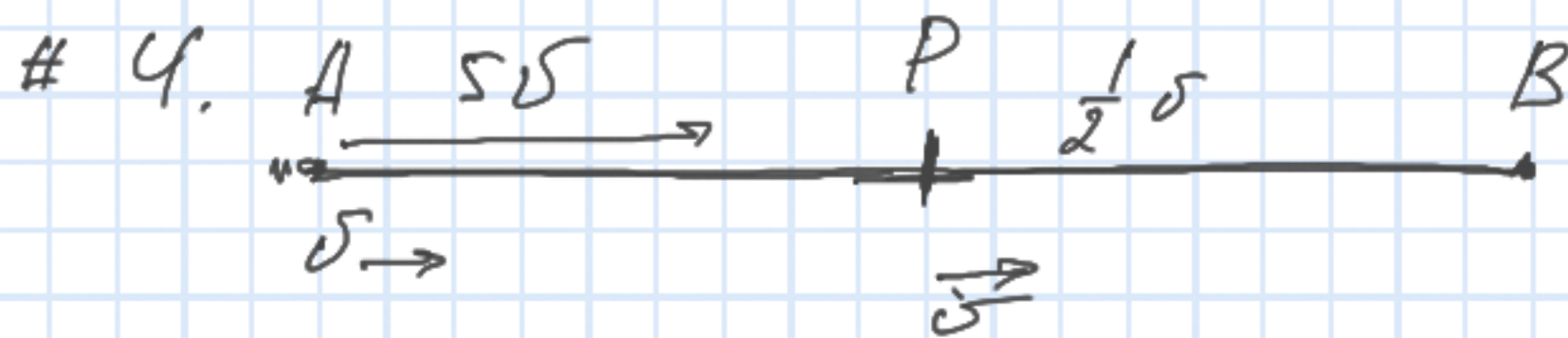


if it's not 1, the answer will be
3-digit

$$\begin{array}{r}
 97 \\
 \times 11 \\
 \hline
 97 \\
 97 \\
 \hline
 1067
 \end{array}$$

#2, $111 = 64 + 32 + 8 + 4 + 1 = 2^6 + 2^5 + 2^4 \cdot 0 + 2^3 + 2^2 + 2^1 + 2^0 = 110111_2$

#3 $111_6 = 4 + 2 + 1 = 7$



Answer is: cyclist
 Time needed to car's driver to go from P to B is the same as for cyclist to go from A to B, but at the time of accident, he was at some distance.

formal way:

v - speed of the cyclist,

$5v$ - speed of the car

$\frac{1}{2}v$ - speed after accid.

$$t_{\text{cyclist}} = \frac{S}{v}$$

$$t_{\text{driver}} = \frac{\frac{1}{2}S}{5v} + \frac{\frac{1}{2}S}{\frac{1}{2}v} = \frac{S}{10v} + \frac{S}{v} = \frac{S+10S}{10v} = \frac{11S}{10v} = \frac{11}{10} \frac{S}{v}$$

$$t_{\text{driver}} = \frac{11}{10} \cdot t_{\text{cyclist}}$$

#4. We can consider 100 pancakes as 1 whole

$$\frac{1}{30} + \frac{1}{40} - \frac{1}{60} = \frac{4+3-2}{120} = \frac{5}{120}$$

$$t \cdot \frac{5}{120} = 1 \quad t = 1 \cdot \frac{120}{5} = \frac{120}{5} = 24 \text{ min.}$$

or: in 2 hours

Mom will bake 400 pp.

Dad will bake 300 pp.

Son will eat 200 pp.

$$400 + 300 - 200 = 500 \quad 120 \text{ min} : 5 = 24 \text{ min}$$

6.

$$3456, 6543. \quad 6543 - 3456 = 3087$$

$$1234, 4321. \quad 4321 - 1234 = 3087.$$

\overline{abcd} is a 4-digit number, but also

$$b = a + 1$$

$$c = a + 2$$

$$d = a + 3.$$

a can be 1, 2, 3, 4, 5, 6.

$$\overline{abcd} = 10^3 \cdot a + 10^2 \cdot (a+1) + 10(a+2) + (a+3)$$

$$\overline{dcba} = 10^3(a+3) + 10^2(a+2) + 10(a+1) + a.$$

$$\overline{abcd} = 10^3 a + 10^2(a+1) + 10(a+2) + (a+3)$$

$$\overline{dcba} = 10^3(a+3) + 10^2(a+2) + 10(a+1) + a$$

$$\overline{dcba} - \overline{abcd} =$$

$$= 10^3(a+3) + 10^2(a+2) + 10(a+1) + a -$$
$$- 10^3 a - 10^2(a+1) - 10(a+2) - (a+3)$$

$$= 10^3(a+3-a) + 10^2(a+2-a-1) + 10(a+1-a-2) + (a-a-3)$$

$$= 10^3 \cdot 3 + 10^2 \cdot 1 + 10(-1) + (-3)$$

$$= 10^3 \cdot 3 + 100 - 10 - 3 = 10^3 \cdot 3 + 90 - 3 =$$

$$= 10^3 \cdot 3 + 80 + 10 - 3 = 10^3 \cdot 3 + 80 + 7 =$$

$$= 10^3 \cdot 3 + 10^2 \cdot 0 + 10 \cdot 8 + 7 = 3087.$$

#7.

$$\frac{3}{4} + \left(\frac{5}{8} + t\right) = \frac{11}{12} + \frac{7}{8}$$

$$\frac{5}{8} + t = \frac{11}{12} + \frac{7}{8} - \frac{3}{4}$$

$$\frac{11}{12} + \frac{7}{8} - \frac{3}{4} = \frac{22}{24} + \frac{21}{24} - \frac{18}{24} = \frac{25}{24}$$

$$\frac{5}{8} + t = \frac{25}{24}$$

$$t = \frac{25}{24} - \frac{5}{8} = \frac{25}{24} - \frac{15}{24} = \frac{10}{24} = \frac{5}{12}$$

check: $\frac{3}{4} + \left(\frac{5}{8} + \frac{5}{12}\right) = \frac{18}{24} + \frac{15}{24} + \frac{10}{24} = \frac{43}{24}$

$$\frac{11}{12} + \frac{7}{8} = \frac{22}{24} + \frac{21}{24} = \frac{43}{24}$$

#7.

$$\left(\frac{4}{5} - k\right) - \frac{1}{3} = \frac{1}{6} - \frac{1}{10}$$

$$\frac{4}{5} - k = \frac{1}{6} - \frac{1}{10} + \frac{1}{3}$$

$$\frac{1}{6} - \frac{1}{10} + \frac{1}{3} = \frac{1}{6} + \frac{2}{6} - \frac{1}{10} - \frac{3}{6} - \frac{1}{10} = \frac{1}{2} - \frac{1}{10} = \frac{5}{10} - \frac{1}{10} =$$

$$= \frac{4}{10} = \frac{2}{5}$$

$$\frac{4}{5} - k = \frac{2}{5}$$

$$k = \frac{4}{5} - \frac{2}{5} = \frac{2}{5}$$

check: $\frac{4}{5} - \frac{2}{5} - \frac{1}{3} = \frac{2}{5} - \frac{1}{3} =$

$$= \frac{6}{15} - \frac{5}{15} = \frac{1}{15}$$

$$\frac{1}{6} - \frac{1}{10} = \frac{5}{30} - \frac{3}{30} = \frac{2}{30} = \frac{1}{15}$$

#8.

$$a. \frac{15 \cdot 9 - 15 \cdot 6}{9 \cdot 30} = \frac{15(9-6)}{9 \cdot 15 \cdot 2} = \frac{\cancel{15} \cdot \cancel{3}}{\cancel{3} \cdot \cancel{15} \cdot 2} = \frac{1}{6}$$

$$b. \frac{17 \cdot 4 + 17 \cdot 9}{34 \cdot 52} = \frac{17(4+9)}{17 \cdot 2 \cdot 52} = \frac{\cancel{17} \cdot \cancel{13}}{\cancel{17} \cdot 2 \cdot \cancel{13} \cdot 4} = \frac{1}{8}$$

$$c. \frac{18 \cdot 7 + 18 \cdot 3}{1200} = \frac{18(7+3)}{120 \cdot 10} = \frac{\cancel{18} \cdot \cancel{10}}{\cancel{120} \cdot \cancel{10}} = \frac{\cancel{6} \cdot \cancel{3}}{\cancel{6} \cdot \cancel{10} \cdot 2} = \frac{3}{20}$$

$$d. \frac{24 \cdot 11 - 24 \cdot 3}{300} = \frac{24(11-3)}{300} = \frac{\cancel{3} \cdot \cancel{8} \cdot \cancel{8}}{\cancel{3} \cdot \cancel{100}} =$$

$$= \frac{\cancel{2} \cdot \cancel{4} \cdot 8}{\cancel{25} \cdot \cancel{4}} = \frac{16}{25}$$

