

Math 5a. HW 2.

#1. Let this number be a and b .

$$a + b = 54.$$

$$\begin{aligned} a: 17 &= xR(11) \\ b: 17 &= yR(9). \end{aligned} \Rightarrow$$

$$a = x \cdot 17 + 11 = 17x + 11$$

$$b = y \cdot 17 + 9 = 17y + 9$$

$$17x + 11 + 17y + 9 = 54$$

$$17x + 17y + 20 = 54$$

$$17x + 17y = 54 - 20 = 34$$

$$(x + y) \cdot 17 = 34$$

$$x + y = 34 : 17 = 2.$$

$$a) \quad a = 17 + 11 = 28$$

$$b = 17 + 9 = 26.$$

$$b) \quad a = 11$$

$$b = 43$$

$$c) \quad a = 45$$

$$b = 9.$$

There are a few possibilities:

$$a) \quad \begin{aligned} x=1, & \quad b) \quad x=0 \quad c) \quad x=2 \\ y=1, & \quad y=2, \quad y=0. \end{aligned}$$

#2. Let these numbers be a and b , $a > b$.

$$a + b = 242.$$

$$a : b = 4R(22).$$

$$a = 4 \cdot b + 22$$

$$4b + 22 + b = 242$$

$$5b = 242 - 22 = 220$$

$$b = 220 : 5 = 44$$

$$a = 242 - 44 = 198$$

#3.

a. $-3 \cdot 3 \cdot 3 \cdot 3 = -3^4$

b. $-5m \cdot m \cdot 2 \cdot n \cdot n = -10m^2n^2$

c. $(ab) \cdot (ab) \cdot (ab) \cdot (ab) \cdot (ab) \cdot (ab) = (ab)^6 = a^6b^6$

$$d. -9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 = -9^5$$

$$e. 4 \cdot 7 \cdot 7 \cdot 7 \cdot 7 = 4 \cdot 7^4$$

$$f. (p-9)(p-9)(p-9) = (p-9)^3$$

#4

$$a. (3x)^2 = xxxb.$$

$$\text{can be } (34)^2 = xxxb, \quad 4^2 = \underline{16}$$

$$\text{or } (36)^2 = xxxb, \quad 6^2 = \underline{36}$$

$$b. (2x)^2 = xx9 \quad \text{can be } (23)^2 \quad \text{or } (27)^2$$

last digit 3 will be 9

last digit 7 will give 9 at the end.

5.

$$a^{36} = a^{2 \cdot 18} = (a^2)^{18} = (a^{18})^2$$

$$a^{36} = a^{3 \cdot 12} = (a^3)^{12} = (a^{12})^3$$

$$a^{36} = a^{4 \cdot 9} = (a^4)^9 = (a^9)^4$$

$$a^{36} = a^{6 \cdot 6} = (a^6)^6$$

6. Let note chem as

mom m

dad f

son s daughter d

$$m + s + d + f = 110.$$

$$m = 5d$$

$$5d = f - 6.$$

$$m = f - 6$$

$$f = 5d + 6.$$

$$s = 2d$$

$$s = 2d.$$

$$\underbrace{5d}_{\text{mom}} + \underbrace{5d + 6}_{\text{father}} + \underbrace{d}_{\text{daughter}} + \underbrace{2d}_{\text{son}} = 110.$$

$$13d = 110 - 6 = 104$$

$$d = 104 : 13 = 8.$$

Daughter is 8 y.o., son is 16 y.o., mother is 40 y.o.

and father is 46 y.o.

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$$\frac{1\frac{1}{2} \cdot 2\frac{2}{3} \cdot 0.36}{0.6 \cdot 2\frac{1}{4} \cdot 1\frac{1}{3}} = \frac{2\overset{3}{\cancel{3}} \cdot \overset{20}{\cancel{3}} \cdot \frac{36}{100}}{\frac{6}{10} \cdot \frac{9}{4} \cdot \frac{4}{3}} =$$

$$= \frac{\cancel{2}^{\cancel{3}} \cdot \cancel{2}^{\cancel{3}^4} \cdot \frac{3\overset{6}{\cancel{6}}}{10\cancel{0}} \cdot \frac{1\cancel{0}}{\cancel{6}} \cdot \frac{\cancel{4}}{\underset{3}{\cancel{9}}} \cdot \frac{\cancel{3}}{\cancel{4}}}{4 \cdot 6} = \frac{2 \cdot 2}{5 \cdot 10} = \frac{4}{5}$$