

# Financial Mathematics: Homework #1

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**Problem 1** A small business has a profit of \$22,000. 15% of the profit is obtained by selling apples. How much money does the small business make by selling apples?

*Answer:*

The business makes  $0.15 \times \$22,000 = \$3,300$  by selling apples.

**Problem 2** Solve the equation  $25x = 125$ .

*Answer:*

$$x = \frac{125}{25} = 5$$

**Problem 3** Define the distributivity property of real numbers.

*Answer:*

The distributivity property of real numbers is:  $a(b + c) = ab + ac$  and  $(a + b)c = ac + bc$  for all real numbers  $a, b, c$ .

**Problem 4** Solve for  $x$  the equation  $xy + 2 = z$

*Answer:*

If  $y \neq 0$  then we can divide by  $y$ . The solution is  $x = \frac{z-2}{y}$ .

Next, I will present the case  $y = 0$ . If  $z = 2$  the equation has infinitely many solutions (all real numbers are solutions). If  $z \neq 2$  the equation has no solution.

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**Problem 5** Calculate using paper and pencil the following:

$$2^3 =$$

$$2 - 1/2 =$$

$$\log_2 8 =$$

*Answer:*

$$2^3 = 2 \times 2 \times 2 = 8$$

$$2 - 1/2 = 2 - \frac{1}{2} = \frac{4-1}{2} = \frac{3}{2}$$

The  $\log_2 8$  is the number  $x$  such that  $2^x = 8$ . Thus,  $x = 3$ . We conclude  $\log_2 8 = 3$ .