Name:_____ Date:_____

UNIT 10 **LESSON 5**

DO NOW

a. What is 30% of $50?

$.30 \times 50 = \boxed{\$15}$

b. A large soda was 2/5 bigger than a small soda. The large soda is what percent larger than a small soda?

$\frac{2}{5} = .40 \rightarrow 40\%$

c. School A has a populations of 1000 students, school B's population is 20% more than school A. How many students are in school B?

$1000 \times 1.2 = \boxed{1,200 \text{ students}}$

$.20 \times 1000 = 200$

$1000 + 200 = \boxed{1200}$

shorter way

Aim: Percent Problems

1. Guy and Jim work at a furniture store. Guy is paid $185 per week plus 3% of his total sales in dollars, x. Jim is paid $275 per week plus 2.5% of his total sales in dollars, x. Determine the value of x, in dollars, that will make their weekly pay the same.

Guy: $Y = .03x + 185$

Jim: $Y = .025x + 275$

$.03x + 185 = .025x + 275$

$-.025x \qquad -.025x$

$.005x + 185 = 275$

$-185 \quad -185$

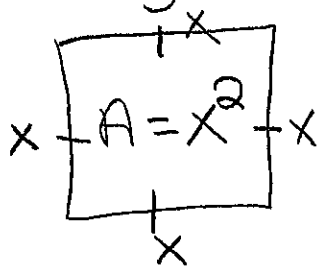
$\frac{.005x}{.005} = \frac{90}{.005}$

$x = 18000$

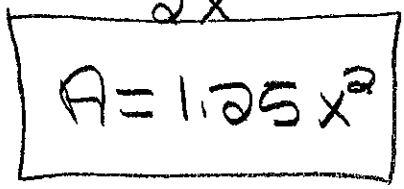
$\boxed{\$18,000}$

2. New Clarendon Park is undergoing renovations to its gardens. One garden that was originally a square is being adjusted so that one side is doubled in length, while the other side is decreased by three meters. The new rectangular garden will have an area that is 25% more than the original square garden. Write an equation that could be used to determine the length of a side of the original square garden. Explain how your equation models the situation. Determine the area, in square meters, of the new rectangular garden.

original



new rectangle



Length = 2x = 16
width = x − 3 = 5
Area = 1.25x²

$A = L \cdot W$

$1.25x^2 = 2x(x-3)$

$1.25x^2 = 2x^2 - 6x$

$-1.25x^2 \quad -1.25x^2$

$0 = .75x^2 - 6x$

$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(.75)(0)}}{2(.75)}$

$x = \frac{6 \pm \sqrt{36}}{1.5}$

$\frac{6+6}{1.5}, \quad \frac{6-6}{1.5}$

8, & reject

$A = L \cdot W$

$A = 16(5)$

$A = 80\,m^2$

3. Joe has a rectangular patio that measures 10 feet by 12 feet. He wants to increase the area by 50% and plans to increase each dimension by equal lengths, x. Which equation could be used to determine x?

1) $(10+x)(12+x) = 120$
2) $(10+x)(12+x) = 180$
3) $(15+x)(18+x) = 180$
4) $(15)(18) = 120 + x^2$

original

$10(12) = A$

$120 = A$

Increased Area

$120 \times 1.5 = 180 \rightarrow$ Area

4. The school newspaper surveyed the student body for an article about club membership. The table below shows the number of students in each grade level who belong to one or more clubs. If there are 180 students in ninth grade, what percentage of the ninth grade students belong to more than one club?

$\begin{array}{r} 33 \\ +\,12 \\ \hline 45 \end{array}$

$\frac{45}{180} = .25$ 25%

	1 Club	2 Clubs	3 or More Clubs
9th	90	33	12
10th	125	12	15
11th	87	22	18
12th	75	27	23