**Math 120 In-Class Practice Worksheet**
**Examples from Chapters 14, 15, 17, 18, and 20**

Name: _____

*(Put the answers in the boxes on the right)*

Sales tax in La Mirada is 10%. If you purchase an item and the total charge (price plus tax) is $13.75, what was the original price of the item?

Original + tax = total

$x + 10\% \cdot x = \$13.75$

$x + 0.10x = 13.75$

$1.10x = 13.75$

$x = \frac{13.75}{1.10} = 12.50$

$12.50

Nancy has 7 coins. Some are quarters ($0.25) and some are dimes ($0.10). All together they are worth $1.15. How many nickels and how many quarters does Nancy have?

Q + d → $1.15

Value of quarters + value of dimes = 115 cents

$25x + 10(7-x) = 115$

$25x + 70 - 10x = 115$

$15x + 70 = 115$

$15x = 115 - 70$

$15x = 45$

$x = 3$

3 quarters

In a certain course, there are two exams worth 30% each, a major paper worth 20% and homework worth 20%. If a student got a score of 80 on the first exam, a score of 90 on the paper and homework grade of 70, what is the lowest score the student can get on the second test to have a semester grade of 77?

Exam 1 30% 80
Exam 2 30% x
Paper 20% 90
HW 20% 70

$(30\%)80 + (30\%)x + (20\%)90 + (20\%)70 = 77$

$(0.3)80 + (0.3)x + (0.2)90 + (0.2)70 = 77$

$24 + 0.3x + 18 + 14 = 77$

$0.3x + 56 = 77$

$0.3x = 77 - 56$

$0.3x = 21$

$x = \frac{21}{0.3} = 70$

70

Solve the equation for x: $\frac{5}{3} = \frac{15}{x}$

$x \cdot \frac{5}{3} = \frac{15}{x} \cdot x$

$3 \cdot \frac{5x}{3} = 15 \cdot 3$

$5x = 45$

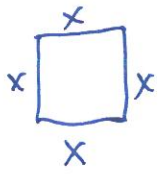
$\frac{5x}{5} = \frac{45}{5}$

$x = 9$

$x = 9$

If you have 4000 feet of fence, the largest rectangular area you could fence would be _____ square feet.

Use a square




$x+x+x+x=4000$

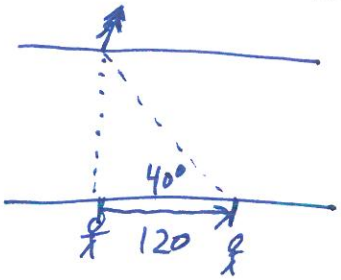
$4x=4000$

$x=1000$

**1,000,000**

Area = height x width $= 1000 \times 1000 = 1{,}000{,}000$

To measure the width of a river, a person standing on one bank of a river spots a tall tree directly across the river. She then walks to another point 120 feet downstream. From that point, the angle between the river bank and the line of sight to the tall tree is 40°. The width of the river is _____





$\tan = \frac{opp}{adj}$

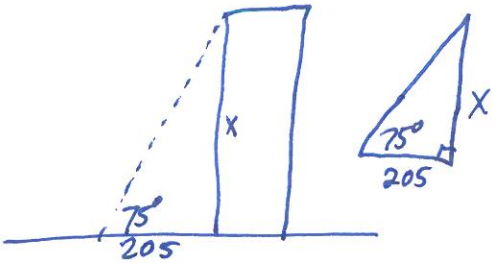
$\tan 40° = \frac{x}{120}$

$x = (\tan 40°)(120)$

$x = 0.8391 \cdot 120 = 100.7$

**100.7 feet**

At a point on the ground, located at a distance of 205 feet from the base of a building, an observer finds that the angle between the horizontal and the line of sight to the top is 75°. How tall is the building? _____




$\tan = \frac{opp}{adj}$

$\tan 75° = \frac{x}{205}$

$x = (\tan 75)(205)$

$x = (3.732)(205) = 765$

**765 feet**

If you put $2000 into an accout paying 6% annually, how much will you have after three years? Use the equation $\mathbf{y = A\,(1+r)^x}$ where A is the original amount, r is the interest rate, and x is the number of years.

$1.06^3 = 1.06 \times 1.06 \times 1.06$

$y = 2000(1+6\%)^3$

$= 2000(1+0.06)^3$

$= 2000(1.06)^3 = 2000 \cdot 1.191016 = 2382.03$

**$2382.03**

Kepler's Law is $\mathbf{T = 0.0005465\ D^{1.5}}$. The average distance from the sun to the planet Mars is 228 million meters. The number of earth years in one revolution of Mars around the sun is _____

$x^{1.5} = x \cdot \sqrt{x}$

$T = 0.0005465\,(228)^{1.5}$

$= 0.0005465 \cdot 228 \cdot \sqrt{228}$

$= 1.88$

**1.88 years**

For free fall, distance and time are related by: $s = 16t^2$. When t = 2 seconds, s = _____

$S = 16 \cdot (2)^2$

$= 16 \cdot 4$

$= 64$

S = distance
t = time
v = velocity

64

For free fall, velocity and time are related by **v = 32t**. How long will it take a falling object to reach a speed of 128 feet/sec? $v = 128$

$v = 32t$

$128 = 32t$ $\quad \frac{128}{32} = t$

$4 = t$

4 seconds

If an object is dropped and falls for 3 seconds, its **average** speed during the 3 seconds is:

average speed = $\frac{\text{total distance}}{\text{total time}}$

distance $= s = 16t^2$

$= 16(3)^2$

$= 16 \cdot 9$

$= 144$

average speed = $\frac{144}{3} = 48$

48 feet per sec

If you travel 500 miles in 8 hours, your average speed was _____ miles / hour

average speed = $\frac{\text{total miles}}{\text{total hours}} = \frac{500}{8} = 62.5$

62.5 mph

Write an equation of the line which has a slope of 3 and passes through the point (4,7)

$y - y_1 = m(x - x_1)$

$y - 7 = 3(x - 4)$

$y - 7 = 3(x - 4)$

The slope of the line containing the points (4, – 1) and (3,–4) is _____

$m = \frac{\text{difference in } y}{\text{difference in } x} = \frac{-1 - -4}{4 - 3} = \frac{-1 + 4}{1} = \frac{3}{1} = 3$

$y - -1 = 3(x - 4)$ $\quad y + 1 = 3(x - 4)$

$y + 1 = 3(x - 4)$

The line whose equation is y = 3x + 5 contains all of the following points except:
(-1,-2) (2,11) (3, 14) (0,5) (8,1)

$y = 3x + 5$

$14 = 3 \cdot 3 + 5 = 9 + 5$

$14 = 14$ ✓ YES

$y = 3x + 5$

$1 = 3 \cdot 8 + 5$

$\times \quad 1 = 24 + 5$ No

(8,1)

The line **perpendicular** to y = 4x + 5 has a slope of m = _____

$y = mx + b$ $\quad$ slope = 4

perpendicular slope $= -\frac{1}{4}$ (negative reciprocal)

$-\frac{1}{4}$