Name _____ Introduction to Technical Mathematics
Date _____ Class #5A www.wnyssis.com.

## *Chapter 5 – 5: Ratio and Proportion*

**Section 1. Motion, Money, and Mixture Problems.**

1. The formula for the distance traveled by an object at a constant, or average rate of speed: _____

2. The 3 inversions of this formula: _____

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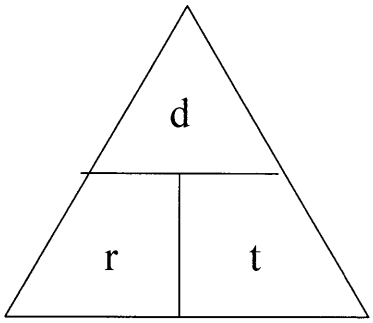
_____




3. Using a TABLE in the Solution of a Distance/Rate Problem.

A boy and his father are paddling canoes up the Erie Canal. The boy can paddle is canoe at a rate of 4 miles per hour, while the father can paddle at a rate of 2 miles per hour. In how many hours will the boy and his father be 5 miles apart?

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4. Two crews are laying blacktop on a road. They start at opposite ends of the road and they are 12 miles apart. They begin working toward each other. The first crew lays blacktop at an average rate that is 0.75 miles a day faster than the other crew. The two crews meet in 3.2 days. Find the rate of each crew.

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**Section 2. Money Problems. The formula for Simple Interest: _____**

1. Paul and Donna invested $9400, part at 5% simple interest and the rest at 7% simple interest for a period of one year. How much did they invest at each rate if their annual income from both investments is $610?

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2. Sharon invested $20,000, part at 5% simple interest and the rest at 7% simple interest for a period of 1 year. How much is invested at each rate, if the interest earned in the 7% account is $440 more than the interest earned in the 5% account?

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**Section 3. Mixture/Money/Amount Problems.**

1. At Tinseltown the costs of an adult movie are $7.50 for the evening show and $4.75 for the matinee. One day there was one showing of Hitch in the afternoon (a matinee) and one show (regular priced) in the evening. If 310 tickets were sold, resulting in receipts of $2022.50, how many adults attended each of the shows?

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2. At Agway Gardens stores, birdfood is sold in bulk. In one barrel are sunflower seeds that sell for $1.80 per pound. In a second barrel is cracked corn that sells for $1.40 per pound. If the store bags a mixture of the two by mixing 2.5 lbs of the sunflower seeds with 1 pounds of the cracked corn, what should be the cost per pound, of the mixture?

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3. Nick has two cans of white paint. One contains 2% yellow pigment and the other can contains 5% yellow pigment. Nick wants to mix the two paints together to produce a paint with 4% yellow pigment. How much of the 5% yellow pigment paint needs to be mixed with 0.4 gallons of the 2% yellow pigment paint to get the desired result?

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4. A pharmacist has a 60% solution of the drug, sodium iodite. She also has a 25% solution of the same drug. She gets a prescription calling for a 40% solution of the drug. How much of each should she mix to make 0.5L of the 40% solution?

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## *Chapter 4.5: Variation.*

### Section 1. Variations Defined.

1. When "y varies directly as x", there must be a constant factor "k" that will affect the letter x as x changes to yield predictable outcomes for y. We can define that as and equation $y = kx$

   The letter "k" is known now as the constant of proportionality.

2. The 4 Forms of Variation:

   a. y varies directly as x _____

   b. y varies indirectly as x _____

   c. y varies directly as the square of x _____

   d. y varies inversely as the square of x _____

   e. y varies directly as x and inversely as z-squared _____

**Practice Question:**

a. If y varies directly as x, and x = 6 when y = 18, find the value of y when x = 5.

   Process:

b. y is directly proportional to x. y = 24 when x = 4. Find the value of y when x = 15.

c. If y varies directly as the square of x. When y = 16 and x = 2. What is the value of y when x = 5?

d. Find y when x = 5 if y varies directly as x, and y = 20 when x = 8

e. Find y when x = 5 if y varies directly as the square of x, and y = 6 when x = 8

f. Find s when t = 10 if s is inversely proportional to t, and s = 100 when t = 5.

**Practice Questions 3.**

d. n is inversely proportional to the square of p and n = $\frac{1}{27}$ when p = 3

**Section 3. Compound Variation Problems.**

1. Find s when p = 75 and q = 5 if s varies directly as p and inversely as the square of q and s = 100 when p = 4 and q = 6.

2. Find z when x = 12 and y = 4 if z varies inversely as the product xy. We know that z = 4 when x = 2, and y = 3.

## *Chapter 5-1 Function Notation*

Define: Function: _____

_____

Notation: _____

Independent Variable _____

Dependent Variable _____

**Functions Section – Evaluating Functions.**

1. Consider the equation: $y = x^2 - 5$, we say that $y = f(x)$, when $f(x) = x^2 - 5$

   Write two "equivalent" equations/expressions: _____ = _____

2, Consider $f(x) = 5 - 2x$

   Evaluate when x = 0 = _____ Evaluate when x = −1 = _____

3. Consider When $f(x) = 4x - x^2$. *Find* $f(-3)$

4. If $f(x) = x^2 + 1$, *find* $f(a)$, $f(-a)$, $f(a + 1)$

5. Relations and Functions: $y^2 = x^2$ *when* $x = 2$

**Homework Section:**

| Section | Page(s) | Problem(s) |
|---|---|---|
| 4 – 4 | 138 → 139 | 15, 17, 21, 25 |
| 4 – 5 | 148 → 149 | 47 →71 Odd, 73, 75 |
| 5 – 1 | 161 → 163 | 9 → 45 Odd. |

* EOO means "Every Other Odd".