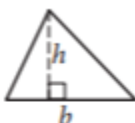$A = \pi r^2$
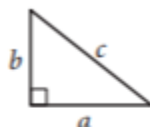
$C = 2\pi r$
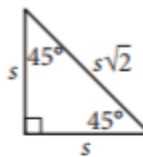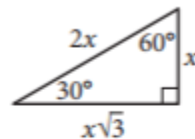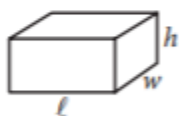
$A = \ell w$

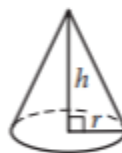$A = \frac{1}{2} bh$

$c^2 = a^2 + b^2$

Special Right Triangles

$V = \ell wh$

$V = \pi r^2 h$

$V = \frac{4}{3}\pi r^3$

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\ell wh$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π.

The sum of the measures in degrees of the angles of a triangle is 180.

NC Set #1 Part A

1.   If $\dfrac{x-1}{3} = k$ and $k = 3$, what is the value of x ?

A)   2

B)   4

C)   9

D)   10

2.

$$m = \dfrac{\left(\dfrac{r}{1,200}\right)\left(1 + \dfrac{r}{1,200}\right)^{N}}{\left(1 + \dfrac{r}{1,200}\right)^{N} - 1} \cdot P$$

The formula above gives the monthly payment m needed to pay off a loan of P dollars at r percent annual interest over N months. Which of the following gives P in terms of m, r, and N ?

A) $P = \dfrac{\left(\dfrac{r}{1,200}\right)\left(1 + \dfrac{r}{1,200}\right)^{N}}{\left(1 + \dfrac{r}{1,200}\right)^{N} - 1} \cdot m$

B) $P = \dfrac{\left(1 + \dfrac{r}{1,200}\right)^{N} - 1}{\left(\dfrac{r}{1,200}\right)\left(1 + \dfrac{r}{1,200}\right)^{N}} \cdot m$

C) $P = \left(\dfrac{r}{1,200}\right) m$

D) $P = \left(\dfrac{1,200}{r}\right) m$

3. For $i = \sqrt{-1}$, what is the sum $(7 + 3i) + (-8 + 9i)$?

A) $-1 + 12i$

B) $-1 - 6i$

C) $15 + 12i$

D) $15 - 6i$

4. If $t > 0$ and $t^2 - 4 = 0$, what is the value of t ?

5.
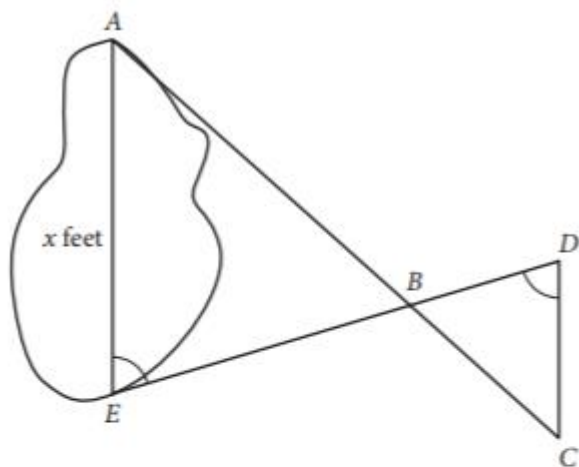
A summer camp counselor wants to find a length, x, in feet, across a lake as represented in the sketch above. The lengths represented by AB, EB, BD, and CD on the sketch were determined to be 1800 feet, 1400 feet, 700 feet, and 800 feet, respectively. Segments AC and DE intersect at B, and $\angle AEB$ and $\angle CDB$ have the same measure. What is the value of x ?

NC Set #1A Key

1. D

2. B

3. A

4. 2

5. 1600

NC Set #1 Part B

1. Kathy is a repair technician for a phone company.
    Each week, she receives a batch of phones that need
    repairs. The number of phones that she has left to fix
    at the end of each day can be estimated with the
    equation $P = 108 - 23d$, where P is the number of
    phones left and d is the number of days she has
    worked that week. What is the meaning of the
    value 108 in this equation?

    A) Kathy will complete the repairs within 108 days.
    B) Kathy starts each week with 108 phones to fix.
    C) Kathy repairs phones at a rate of 108 per hour.
    D) Kathy repairs phones at a rate of 108 per day.

2. On Saturday afternoon, Armand sent m text
    messages each hour for 5 hours, and Tyrone sent p
    text messages each hour for 4 hours. Which of the
    following represents the total number of messages
    sent by Armand and Tyrone on Saturday afternoon?

    A) $9mp$
    B) $20mp$
    C) $5m + 4p$
    D) $4m + 5p$

3. If $\dfrac{a}{b} = 2$, what is the value of $\dfrac{4b}{a}$?

    A) 0
    B) 1
    C) 2
    D) 4

4.

$$x + y = -9$$
$$x + 2y = -25$$

According to the system of equations above, what is the value of x ?

5. If the quadratic equation $ax^2 + 2x - 5 = 0$ has one real solution, what is the value of a?

NC Set # Part B Key

1. B

2. C

3. C

4. 7

5. -1/5

1. If $\dfrac{x}{y} = -2,$ what is $\dfrac{y}{4x}$?

A) $\dfrac{1}{2}$

B) $-\dfrac{1}{2}$

C) $-\dfrac{1}{4}$

D) $-\dfrac{1}{8}$

2. Oscar has purchased a new cell phone plan and the monthly cost of his bill in dollars, C, is calculated based on the amount of data he uses, x, in kilobytes, according to the following equation: $C = 20 + 0.05k$ What does the 0.05 stand for in the equation?

A) Oscar owes $0.05 per month

B) Each dollar pays for 0.05 kilobytes of data

C) Each additional kilobyte of data costs $0.05

D) The bill will always be at least $20, no matter how much data is used.

3. If $i = \sqrt{-1},$ find the difference $(4i - 7) - (7i - 3).$

A) $3i + 10$

B) $3i - 4$

C) $-3i - 10$

D) $-3i - 4$

4. If $x < 0$ and $x^2 - 4x - 5 = 0$, what is the value of x?

For the system of equations below, what is the value of n?

5. $2m - 3n = 4$

$6m + n = 32$

NC Set # 1 Part C Key

1. D

2. C

3. D

4. -1

5. 2