

Optional SAMM Summer Packet

USE A SEPARATE SHEET OF PAPER AND SHOW ALL WORK.

I. Polynomials

A. Factor Completely.

1) $t^2 - 4t - 21$

2) $x^3 - 8$

3) $27x^3 + 125$

4) $10m^3n^2 - 15m^2n + 25m$

5) $25x^2 - 49$

B. Simplify the following expressions.

1) $(-3x^2 + 4x - 7) + (2x^2 - 7x + 8)$

2) $5x^2 \cdot 2x^5$

3) $(-2c^3)^2$

4) $(39a^4 - 4a^3 + 2a^2 - a - 7) - (10a^4 + 3a^3 - 2a^2 - a + 8)$

5) $\frac{10 \square 2^6}{8 \square 2^{-2}}$

6) $(3x + 7)(2x + 5)$

7) $-3xy^3(x - 2y)$

8) $(3x^2 + x - 1)(2x - 3)$

9) $(8a^3b^2)(2a^4b^5)$

10) $(-3x^2y^3z)^3$

11) $(15a^4b^2c)^0$

12) $\frac{3x^3y^2}{6x^2y^5}$

13) $(x + 6)^2$

14) $t^3 \cdot t^n - 3$

C. Solve the following quadratic equations for x.

1) $(2x + 1)(x + 3) = 0$

2) $x^2 + 6x = 0$

3) $2x^2 + 4x = -3$

4) $x^2 = 16$

II. Linear Operations

A. Graph each of the following on graph paper or create your own grid.

1) $y = -\frac{3}{4}x + 4$

2) $y = (x - 2)^2 + 1$

3) $y = |x|$

B. Answer each of the following concerning **linear** equations.

- 1) Determine the slope of the line containing the points (6, -2) and (-1, 5).
 - 2) Determine an equation for a line with slope $\frac{1}{2}$ and y-intercept at (0, -3).
 - 3) Determine an equation for a line parallel to $y = -3x + 4$, containing the point (2, 1).
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III. Rewriting and Solving Equations

A. Solve each equation for y.

1) $7y + 6x = 10$

2) $\frac{1}{4}y - 7x = \frac{15}{2}$

B. Find the solution(s) of the given systems of equations. Write answers in the form (x, y).

1) $\begin{cases} 2x + 5y = -7 \\ 7x + y = -8 \end{cases}$

2) $\begin{cases} 4x + 9y = 2 \\ 2x + 6y = 1 \end{cases}$

C. Solve for x and y. Use matrices for #6.

1) $\begin{bmatrix} 4 & -1 \\ 3 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$

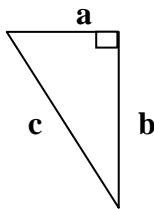
2) $\begin{cases} x + 9y = 9 \\ 3x + 6y = 6 \end{cases}$

IV. Pythagorean Theorem and Trigonometric Ratios (from Geometry)

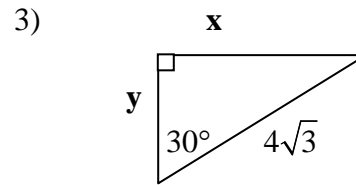
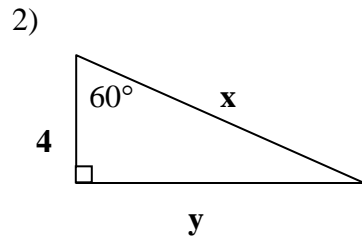
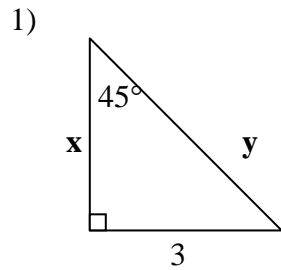
A. Solve for the missing side of the triangle using the Pythagorean Theorem given right ΔABC :

1) $a = 6$ ft. $b = 8$ ft.

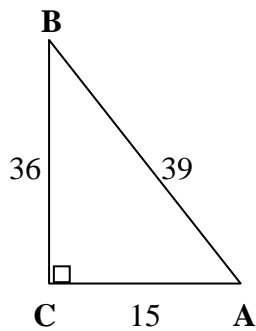
2) $b = 17$ ft. $c = 19$ ft.



B. Solve for x and y using a 45-45-90 (ratio of sides $1:1:\sqrt{2}$) or a 30-60-90 triangle (ratio of sides $1:\sqrt{3}:2$).



C. Given the right triangle, determine the trigonometric ratios.

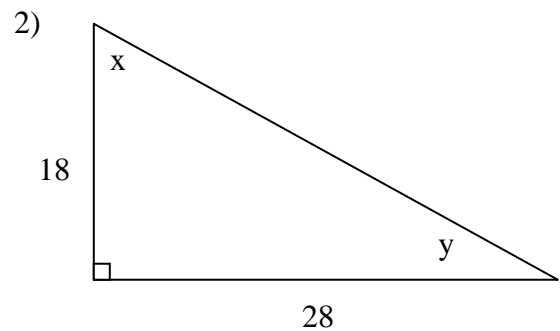
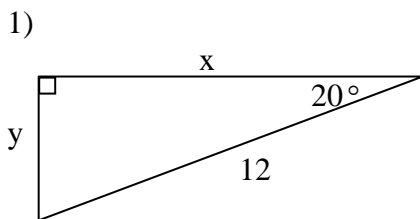


1) $\sin A$

2) $\cos A$

3) $\tan A$

D. Use trig ratios to solve for x and y in each right triangle. Round answers to three places after the decimal point.



V. Statistics (from Algebra 1)

1) **Multiple choice** (choose the best answer)

Nathan is conducting a simulation concerning seniors who discuss their studies at home. He chooses to use a random number table with digits 0-9, where 0, 1, 2, 3 represent a senior who discusses studies at home and 4, 5, 6, 7, 8, 9 represents a senior who does not discuss studies. Based on this digit assignment, what is the probability that a senior discusses studies at home?

- A.** 6% **B.** 30% **C.** 40% **D.** 60%

2) A bubble gum machine has 50 gumballs inside. There are 22 red, 14 blue, 9 green, and 5 white gumballs. A child chooses one gumball at random.

- a. What is the probability that the gumball chosen is white?
- b. What is the probability that the gumball chosen is NOT green?

3) Which of the following sampling methods would provide a simple random sample of 50 college students?

- Survey the first 50 students to enter the math building in the morning.
- Obtain a list of alphabetized student names, and then select every 5th student on the list until there are 50 students selected.
- Place the name of each student in a hat, and then draw 50 names.

Use the criteria for simple random sampling to justify your answer.