

Richard Montgomery High School

Department of Mathematics

Summer Math Packet for students entering MYP Geometry or Pre-IB Geometry

Name: _____

Date: _____

This packet must be completed and ready to turn in to your new math teacher on the **first day of school**. It will be graded and you will be tested on the material in this packet within the first few weeks of school.

Try to wait until late July or early August to begin working on this packet. We want to make sure the material is fresh in your mind.

You may work with a classmate or a peer. You may use textbooks or other sources to help you complete the packet, however, each student must submit their own packet, and each student is responsible for understanding the material contained in the packet. Calculators are allowed. You are expected to show an appropriate amount of work to support your answers.

Please do your work directly on this packet. Additional work, completed on separate paper, may be attached to the back of the packet.

1. Perform the operation indicated. Simplify.

a. $\frac{11}{15} + \frac{7}{9} - \frac{4}{5}$

b. $\frac{12}{40} \cdot \frac{15}{45}$

c. $\frac{-10}{21} \div \frac{15}{28}$

d. $2 - 3(x - 2 - 5(x - 5))$

e. $6 - 2(x - 3 - (x + 4) + 3(x - 2))$

2. Solve for x in the equation.

a. $4x - 3(x + 8) = 12$

b. $\frac{1}{4}x + 3 = 2$

c. $5x + 10 = 59 - 2x$

d. $3(4x + 7) = 7x + 11$

e. $35 - 13x = 2(7x - 8)$

f. $\frac{2}{5}x + 4 = \frac{1}{5}(8 - x)$

g. $5x + 2 = 8x - 2$

h. $\frac{5x}{3} + 4 = 9$

i. $3(5 - x) = 2(2x - 5)$

j. $\frac{5x - 3}{4} = 8$

k. $\frac{x}{12} = \frac{4}{3}$

l. $4(x - 1) = 3(x + 1)$

m. $\frac{2}{3}x + \frac{3}{4} = \frac{25}{12}$

n. $\frac{2}{3}(x + 9) = 2$

o. $\frac{2}{x - 3} = \frac{5}{x + 1}$

p. $\frac{x}{5} = \frac{1}{x + 4}$

q. $\frac{x + 3}{x} = \frac{x - 3}{2}$

r. $\frac{x - 4}{x - 2} = \frac{1}{x - 4}$

3. Solve for the variable indicated.

a. Solve for r : $A = P + Prt$

b. Solve for y : $2x - 3y + 12 = 0$

c. Solve for l : $R = \frac{kl}{d^2}$

d. Solve for v : $S = -\frac{1}{2}gt^2 + vt$

e. Solve for w : $ab + cw = d$

f. Solve for x : $\frac{x}{b} = \frac{c}{d}$

4. Decide whether the point $(-2, -2)$ lies on the line $2x + 3y = 10$. Write yes or no and show work to support your answer.
5. Find the slope of the line containing the points $(3, 5)$ and $(6, 9)$.
6. Find the x-intercept and the y-intercept of the line $3x + 4y = -24$.
7. Find an equation of the line with slope $\frac{3}{2}$ and y-intercept of -5 .
8. Find an equation of a vertical line that passes through the point $(-2, -7)$.
9. Find an equation of the line that passes through the points $(1, 6)$ and $(3, -4)$.
10. Find an equation of the line with slope $\frac{1}{2}$ that passes through the point $(-2, 5)$.
11. Find an equation of the line with slope $-\frac{3}{4}$ and x-intercept of 8 .
12. Find an equation of the line that passes through the origin and the point $(4, -8)$.

13. Find an equation of the line that passes through the point $(-2,-7)$ and has a slope of 0.
14. Find an equation of the line that passes through the point $(-1,4)$ and is parallel to the line with equation $y = 2x - 3$.
15. Find an equation of the line that passes through the point $(2,5)$ and is perpendicular to the line with equation $y = \frac{1}{3}x + 2$.
16. Find the slope and the y-intercept of the line whose equation is $5x + 10y = 20$.
17. Multiply and simplify.
- a. $3x(4x^2 - 2x + 1)$
 - b. $-x^2(2x^3 - 14x^2 + x)$
 - c. $(x + 5)(x - 3)$
 - d. $(x - 4)(x + 4)$
 - e. $(3x + 5)(2x + 1)$
 - f. $(2x - 3)(x + 3)$
 - g. $(4x - 3)(2x - 5)$
 - h. $(3x - 1)^2$

18. Factor completely.

a. $x^2 + 7x + 12$

b. $2x^2 - x - 15$

c. $x^2 - 25$

d. $x^2 - 8x + 16$

e. $5x^2 + 15x$

f. $-6x^3 + 3x^2 + 3x$

g. $x^2 + 10x - 24$

h. $x^2 + 5x - 14$

i. $3x^2 + 10x + 3$

j. $4x^2 - 49$

k. $3x^2 - 11x + 6$

l. $81x^2 - 1$

m. $3x^2 + 8x + 5$

n. $3x^2 + 11x + 10$

o. $2x^2 - x - 6$

p. $3x^2 + 5x - 12$

q. $2x^2 - 6x$

r. $3x^2 + 7x + 2$

s. $x^2 - 12x + 36$

t. $4x^2 + 4x + 1$

u. $6x^2 + 13x + 5$

v. $10x^2 - 7x - 12$

w. $3x^2 + 9x - 12$

x. $6x^2 - 27x + 27$

y. $15x^2 + 16x - 15$

z. $8x^2 - 22x + 5$

19. Solve the quadratic equation by factoring or by the quadratic formula.

a. $x^2 - 9x + 18 = 0$

b. $x^2 + 7x - 8 = 0$

c. $x^2 - 6x + 7 = 0$

d. $3x^2 - 20x - 7 = 0$

e. $2x^2 + x - 15 = 0$

f. $5x^2 + x + 2 = 0$

g. $2x^2 - 4x - 9 = 0$

h. $2x^2 - 8x = 0$

i. $x^2 + 3x = 0$

j. $3x^2 + 5x + 2 = 0$

k. $6x^2 - 27x + 27 = 0$

l. $2x^2 - 3x - 4 = 0$

20. Use properties of exponents to simplify the following.

a. $x^2 \cdot x^4$

b. $\frac{x^{15}}{x^8}$

c. $(3x^3)^2$

d. $\left(\frac{x}{5}\right)^2$

e. $-2xy^2(x^3y^2)^3$

f. $(5x^{-2}y^4)(3x^4y^{-4})$

$$\text{g. } \frac{12x^{-3}y^2z^2}{24x^2y^5z^{-2}}$$

$$\text{h. } (2x)^{-2}y^0(x^{-2}y)^3$$

21. Simplify.

$$\text{a. } \sqrt{20}$$

$$\text{b. } \sqrt{80}$$

$$\text{c. } 3\sqrt{98}$$

$$\text{d. } 5\sqrt{54}$$

$$\text{e. } \sqrt{\frac{16}{49}}$$

$$\text{f. } \sqrt{\frac{18}{25}}$$

$$\text{g. } \sqrt{\frac{3}{8}}$$

$$\text{h. } \frac{\sqrt{7}}{\sqrt{10}}$$

$$\text{i. } \sqrt{28} - 3\sqrt{7} + \sqrt{63}$$

$$\text{j. } \sqrt{200} - \sqrt{242} - \sqrt{2}$$

$$\text{k. } 2\sqrt{8} - \sqrt{32} + 3\sqrt{50}$$

$$\text{l. } \sqrt{54} - \sqrt{24} - \sqrt{48} + \sqrt{75}$$

$$\text{m. } \sqrt{2}(3\sqrt{2} + \sqrt{5})$$

$$\text{n. } \sqrt{6}(2\sqrt{3} - 4\sqrt{2})$$

$$\text{o. } (\sqrt{3} - \sqrt{2})(5\sqrt{2} - 4\sqrt{3})$$

$$\text{p. } (2\sqrt{3} + \sqrt{5})^2$$