

Geometry Summer Packet for 2009

- This packet is intended for students entering Geometry in the following school year. It reviews algebra skills which are used regularly in the Geometry course.
- Work through the packet a section or two at a time. Doing it all at once will be overwhelming and will lead to many unnecessary mistakes.
- Complete the problems on lined loose-leaf notebook paper. Please do not use spiral bound paper. Begin each new section on a new sheet of paper. Do your work in algebra columns, that is, do **not** string equal signs across the page. Show **all** of the work – do not skip steps! Box your final answer.
- Place your paper in the correct order and staple it in the upper left hand corner. Be sure to write your name on each sheet.
- The work is due Wednesday, September 2, 2009. It will be collected at the beginning of class. Late work will not be accepted. Each section is worth 10 points. It will count towards your first quarter project average. Turning the packet in on the first day of school will earn you five bonus points.

I. Solving Equations.

Solve for the variable.

1. $4.2x + 6.4 = 40$
2. $2(y - 3) + 6 = 70$
3. $2t - 3 = 9 - 4t$
4. $6g - (3 - 3g) = 24$
5. $2(x - 3) - 2(x + 4) = 24$
6. $5x + \frac{1}{3} = 2x - \frac{3}{2}$
7. $3(m - 2) - 5 = 8 - 2(m - 4)$
8. $\frac{k}{3} + \frac{k}{6} = \frac{7}{2}$
9. $2(3w + 2) - 12 = 3w - 11$
10. $6x - 3(6 - 5x) + 3x = 10 - 4(2 - x)$
11. $\frac{1}{2}(6 + 4x) - \frac{1}{4}(8x - 12) = \frac{1}{2}(2x - 4)$
12. $5y - [7 - (2y - 1)] = 3(y - 5) + 4(y + 3)$

II. Manipulating Equations

Isolate for the variable x . Assume all values are nonzero.

1. $ax = f$
2. $cx + d = e$
3. $x - p = q$
4. $t - x = r$
5. $nx - s = c$
6. $a(x - 1) = 7a$
7. $ax + 9 = cx$
8. $\frac{bx}{a} = d$
9. $ax - bx = c$
10. $\frac{x - 2}{2} = m + n$
11. $\frac{2}{5}(x + 1) = g$
12. $\frac{2}{3}x = g$
13. $\frac{1}{x} = c + \frac{1}{b}$
14. $\frac{3ax}{5} - 4c = \frac{ax}{5} + 2c$
15. $\frac{y - c}{x - a} = m$
16. $a - b = \frac{d}{x} + \frac{e}{x}$

III. Systems of Equations

Solve each system using elimination method.

$$1. \begin{cases} x + y = 12 \\ x - y = 2 \end{cases}$$

$$2. \begin{cases} -x + 2y = -1 \\ x - 3y = -1 \end{cases}$$

$$3. \begin{cases} 4x + 2y = 4 \\ 6x + 2y = 8 \end{cases}$$

$$4. \begin{cases} x - 3y = 1 \\ 6x - y = 6 \end{cases}$$

$$5. \begin{cases} 2x - 3y = 6 \\ 6x - 9y = 9 \end{cases}$$

IV. Systems of Equations

Solve each system using substitution method.

$$1. \begin{cases} y = x + 2 \\ 2x - y = 1 \end{cases}$$

$$2. \begin{cases} x = 4y - 5 \\ 5x - y = -6 \end{cases}$$

$$3. \begin{cases} y - 3x = 0 \\ 4x + 3y = 26 \end{cases}$$

$$4. \begin{cases} y = 2x - 3 \\ -2x + y = 5 \end{cases}$$

$$5. \begin{cases} \frac{x}{4} - \frac{y}{4} = -1 \\ -3x + 7y = 8 \end{cases}$$

$$6. \begin{cases} .4x - .1y = .6 \\ 2x + 3y = 10 \end{cases}$$

V. Systems of Equations

Solve each system using the method of your choice.

$$1. \begin{cases} 2(2x + 3y) = 0 \\ 7x = 3(2y + 3) + 2 \end{cases}$$

$$2. \begin{cases} 4(3x - y) = 0 \\ 3(x + 3) = 10y \end{cases}$$

$$3. \begin{cases} 2(x + y) = 4x + 1 \\ 3(x - y) = x + y - 3 \end{cases}$$

$$4. \begin{cases} x + \frac{y}{2} = \frac{3}{2} \\ x + \frac{y}{4} = \frac{13}{4} \end{cases}$$

$$5. \begin{cases} \frac{3y - 1}{2} = \frac{3x + 8}{5} \\ \frac{x + y}{2} = \frac{6 + x - y}{2} \end{cases}$$

$$6. \begin{cases} x + 4y = -\frac{1}{2} + 4x \\ 2x + 3y = \frac{x}{2} + 2y + 1 \end{cases}$$

VI. Factoring

Factor each expression.

1. $3a^2 + 3a$
2. $25a^2 - 35a$
3. $12a^3 + 6a^2b + 36ab$
4. $c^2 - 4d^2$
5. $d^3 + 64$
6. $x^2 + 5x + 6$
7. $t^2 - 12t + 27$
8. $r^2 - 11r + 18$
9. $2y^2 - 19y + 24$
10. $5r^2 + 23y + 26$
11. $2z^2 + z - 28$
12. $6c^2 + 11c + 4$
13. $3x^2 - 8xy - 16y^2$
14. $4a^2 + ab - 15b^2$
15. $4x^2 + 8x + 9$

Try this method for solving #9-15

Given: $3y^2 + 7y - 20$

multiply the leading coefficient and the constant

So that $3(-20) = -60$

Find factors of -60 that add up to the middle term, 7

Such as -5 and 12 and rewrite 7y as -5y+12y

Then factor by grouping the first two terms and the second two terms.

$$\begin{aligned} & 3y^2 + \underbrace{7y}_{-5y+12y} - 20 \\ & \underbrace{3y^2 - 5y}_{\text{group}} + \underbrace{12y - 20}_{\text{group}} \\ & y\underbrace{(3y - 5)}_{\text{same}} + 4\underbrace{(3y - 5)}_{\text{terms}} \\ & (3y - 5)(y + 4) \end{aligned}$$

VII. Rational Equations

Cross multiply to solve for the variable.

1. $\frac{1}{3x} = \frac{5}{6}$
2. $\frac{x}{2} + \frac{1}{3} = \frac{5}{6}$
3. $\frac{3}{(x+5)} = \frac{2}{(x+6)}$
4. $\frac{y+1}{8} = \frac{1}{4}$
5. $\frac{y}{5} + 2 = \frac{y}{3}$
6. $\frac{5x}{2} - \frac{1}{2} = x+1$
7. $\frac{x}{4} = \frac{3}{x+1}$

VIII. Radical Expressions

Simplify each radical expression.

1. $\sqrt{81}$
2. $\sqrt{125}$
3. $\sqrt{32}$
4. $\frac{1}{\sqrt{3}}$
5. $\sqrt{\frac{2}{5}}$
6. $\sqrt{50} + 2\sqrt{18} + \sqrt{32}$
7. $\sqrt{x^2 + 4}$