

Honors Geometry Summer Packet

This packet should help you prepare for Honors Geometry at Trumbull High School. Please complete these problems before the first day of school. This packet is MANDATORY. The material within this packet will be assessed within the first week of school.

Simplify each expression.

$$1. \frac{(-5)(-2)-4}{-4\left(\frac{1}{3}\right)} = \frac{10-4}{-\frac{4}{3}} = \frac{6}{-\frac{4}{3}} = 6 \cdot -\frac{3}{4} = -\frac{18}{4} = \boxed{-\frac{9}{2}}$$

$$2. \frac{\frac{4}{5}}{2-\frac{1}{3}} = \frac{\frac{4}{5}}{\frac{5}{3}} = \frac{4}{5} \cdot \frac{3}{5} = \boxed{\frac{12}{25}}$$

$$3. \frac{\frac{x+2}{5}}{\frac{x+3}{10}} = \frac{x+2}{5} \cdot \frac{10}{x+3} \rightarrow \frac{10(x+2)}{5(x+3)} = \frac{10x+20}{5x+15} = \frac{5(2x+4)}{5(x+3)} = \boxed{\frac{2x+4}{x+3}}$$

$$4. \frac{3+\frac{2}{3}}{\frac{1}{2}-3} = \frac{\frac{11}{3}}{-\frac{5}{2}} = \frac{11}{3} \cdot -\frac{2}{5} = \boxed{-\frac{22}{15}}$$

5. $6x^2(3x^3 - 4x + 4)$

$$18x^5 - 24x^3 + 24x^2$$

6. $(-x^2y)^3(2x^3y^2)^2$

$$-x^6y^3 \cdot 4x^6y^4$$

$$-4x^{12}y^7$$

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

$$-27x^9y^6$$

8. $3x(2xy)$

$$6x^2y$$

9. $3x(2x+y)$

$$6x^2 + 3xy$$

10. $(2y - 3)(y + 7)$

$$2y^2 + 11y - 21$$

11. $(3x + 5)(2x - 4)$

$$6x^2 - 2x - 20$$

12. $(3a + 4b)(2a - 5b)$

$$6a^2 - 7ab - 20b^2$$

$$13. (2x - 5)^2$$

$$4x^2 - 20x + 25$$

$$14. \frac{14x^2 + 42x - 7}{7}$$

$$2x^2 + 6x - 1$$

$$15. \frac{20x^2 - 20x - 7}{5x}$$

$$4x - 4 - \frac{7}{5x}$$

Solve for the variable.

$$16. 75 = 3(-6n - 5)$$

$$75 = -18n - 15$$

$$90 = -18n$$

$$-5 = n$$

$$17. -4x + 2(5x - 6) = -3x - 39$$

$$-4x + 10x - 12 = -3x - 39$$

$$6x = -3x - 27$$

$$9x = -27$$

$$x = -3$$

$$18. -16 + 5n = -\frac{1}{2}(-6 + 8n) + 3$$

$$-16 + 5n = 3 - 4n + 3$$

$$9n = 22$$

$$n = \frac{22}{9}$$

$$19. 12(2k+11) = 12(2k+12)$$

$$24k + 132 = 24k + 144$$

$$132 \neq 144$$

\emptyset No Solution

$$20. 4(-x-6)+3 = -2(2x+14)+7$$

$$-4x - 24 + 3 = -4x - 28 + 7$$

$$-4x - 21 = -4x - 21$$

$$-21 = -21$$

TR All Real #'s

$$21. 5(3z-7) = 4(2z+7)$$

$$15z - 35 = 8z + 28$$

$$7z = 63$$

$$z = 9$$

$$22. 5 - 3(2n-3) = 44$$

$$5 - 6n + 9 = 44$$

$$-6n = 30$$

$$n = -5$$

$$23. \frac{1}{3}(2x-4)+5 = -\frac{2}{3}(x+1)$$

$$3\left(\frac{2x}{3} - \frac{4}{3} + 5 = -\frac{2x}{3} - \frac{2}{3}\right)$$

$$2x - 4 + 15 = -2x - 2$$

$$4x = -13$$

$$x = -\frac{13}{4}$$

$$24. \frac{5}{x} = \frac{3}{2}$$

$$3x = 10$$

$$x = \frac{10}{3}$$

$$25. \frac{-4}{2r-9} = \frac{-16}{3r+14}$$

$$-16(2r-9) = -4(3r+14)$$

$$-32r + 144 = -12r - 56$$

$$200 = 20r$$

$$10 = r$$

$$26. \frac{x}{x+5} = \frac{x-4}{x}$$

$$x^2 = x^2 + x - 20$$

$$0 = x - 20$$

$$20 = x$$

$$27. \frac{x-3}{x} = \frac{9}{10}$$

$$9x = 10x - 30$$

$$-x = -30$$

$$\boxed{x = 30}$$

$$28. \frac{5x}{x-3} = \frac{4}{3}$$

$$4x - 12 = 15x$$

$$-12 = 11x$$

$$\boxed{\frac{-12}{11} = x}$$

$$29. 2x - \frac{4}{3}y = 8 \text{ for } y \quad -\frac{3}{4}\left(-\frac{4}{3}y\right) = (8 - 2x) \cdot \frac{-3}{4}$$

$$y = \frac{-24}{4} + \frac{6x}{4}$$

$$\boxed{y = \frac{3}{2}x - 6}$$

$$30. \frac{4}{7}(M+12) = D \text{ for } M$$

$$\frac{4}{7}M + \frac{48}{7} = D$$

$$\frac{7}{4}\left(\frac{4}{7}M\right) = \left(D - \frac{48}{7}\right) \frac{7}{4}$$

$$\boxed{M = \frac{7}{4}D - 12}$$

$$31. 4x + 3y = -20 \text{ for } y$$

$$3y = -20 - 4x$$

$$\boxed{y = \frac{-20}{3} - \frac{4}{3}x}$$

$$32. y = \frac{1}{3}x - 10 \text{ for } x$$

$$3(y + 10) = \left(\frac{1}{3}x\right) \cdot 3$$

$$\boxed{3y + 30 = x}$$

Solve each system of equations.

$$33. \begin{aligned} y &= x - 3 \\ x + y &= 13 \end{aligned}$$

$$x + (x - 3) = 13$$

$$2x = 16$$

$$x = 8$$

$$y = 8 - 3$$

$$y = 5$$

$$\boxed{(8, 5)}$$

34. $4(e+f) = 8(f-4)$

$2(e-1) = f-15$

$4e + 4f = 8f - 32$

$4e - 4f = -32$

$-8e + 4f = 52$

$-4e = 20$

$e = -5$

$2e - 2 = f - 15$

$-(2e - f = 43)$

$-8e + 4f = 32$

$2(-5) - f = -13$

$-10 - f = -13$

$-f = -3$

$f = 3$

35. $2x - 3y = -1$

$y = x - 1$

$2x - 3(x - 1) = -1$

$2x - 3x + 3 = -1$

$-x + 3 = -1$

$-x = -4$

$x = 4$

$y = 4 - 1 = 3$

$y = 3$

36. $-7x - 2y = -13$

$x - 2y = 11$

$x = 11 + 2y$

$-7(11 + 2y) - 2y = -13$

$-77 - 14y - 2y = -13$

$-77 - 16y = -13$

$-16y = 64$

$y = -4$

$x - 2(-4) = 11$

$x + 8 = 11$

$x = 3$

37. $2x - 8y = 6$

$-5x - 20y = -15$

$2x = 6 + 8y$

$x = 3 + 4y$

$-5(3 + 4y) - 20y = -15$

$-15 - 20y - 20y = -15$

$-40y = 0$

$y = 0$

$2x - 8(0) = 6$

$x = 3$

38. $3 + 2x - y = 0$

$-3 - 7y = 10x$

$y = 3 + 2x$

$-3 - 7(3 + 2x) = 10x$

$-3 - 21 - 14x = 10x$

$-24 = 24x$

$x = -1$

$3 + 2(-1) - y = 0$

$1 - y = 0$

$1 = y$

Solve each quadratic by factoring.

39. $y^2 - 9 = 0$

$$(y-3)(y+3) = 0$$

$$y = \pm 3$$

40. $w^2 + 3w = 10$

$$w^2 + 3w - 10 = 0$$

$$(w+5)(w-2) = 0$$

$$w = -5, 2$$

41. $3v^2 = v + 10$

$$3v^2 - v - 10 = 0$$

$$(3v+5)(v-2) = 0$$

$$3v+5=0$$

$$3v = -5$$

$$v = -\frac{5}{3}$$

$$v-2=0$$

$$v = 2$$

42. $x^2 - 15x = -50$

$$x^2 - 15x + 50 = 0$$

$$(x-10)(x-5) = 0$$

$$x = 10, 5$$

43. $3p^2 - 2p - 5 = 0$

$$(3p-5)(p+1) = 0$$

$$3p-5=0$$

$$3p = 5$$

$$p = \frac{5}{3}$$

$$p+1=0$$

$$p = -1$$

44. $2x^2 + 11x + 5 = 0$

$$(2x+1)(x+5) = 0$$

$$2x+1=0$$

$$2x = -1$$

$$x = -\frac{1}{2}$$

$$x+5=0$$

$$x = -5$$

45. $7x^2 + 53x + 28 = 0$

$$(7x+4)(x+7) = 0$$

$$7x+4=0$$

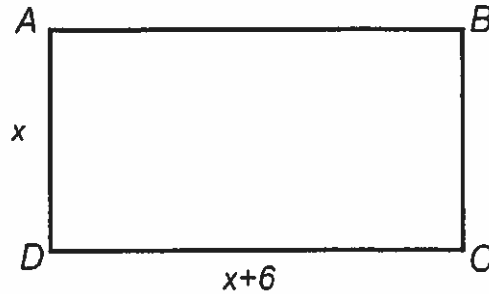
$$7x = -4$$

$$x = -\frac{4}{7}$$

$$x+7=0$$

$$x = -7$$

Use rectangle $ABCD$ to answer examples 42-46.



46. Write the equation that shows the perimeter of the rectangle is 48 inches.

$$x + x + 6 + x + 6 + x = 48$$

$$4x + 12 = 48$$

47. Solve for x .

$$4x + 12 = 48$$

$$4x = 36$$

$$x = 9$$

48. Find the area of the rectangle.

$$\text{area} = x(x+6)$$

$$= 9(9+6) = 9(15) = 135$$

49. Based on the figure above, write the equation that shows the area of the rectangle is 72 square inches.

$$72 = x(x+6) = x^2 + 6x$$

50. Find the dimensions of the rectangle based on your findings in #48.

$$x^2 + 6x - 72 = 0$$

$$9 \times 15 \quad (\neq 48)$$

$$\frac{-b \pm \sqrt{b^2 - 4(a)(c)}}{2a}$$

$$(x-12)(x+6) = 0$$

$$x = 12$$

$$6 \times 12 \quad (\#49)$$

$$= \frac{-b \pm \sqrt{36 + 4(1)(72)}}{2}$$

$$= \frac{-6 \pm \sqrt{324}}{2} = \frac{-6 \pm 18}{2} = -3 \pm 9 = -12 \text{ or } 6$$

must be positive

$$x = 6$$

In examples #51 and 52, solve using one variable.

51. The sum of two numbers is 16. The greater of the two numbers is one more than four times the lesser number.

$$\begin{aligned}x + y &= 16 \\ x &= 4y + 1\end{aligned}$$

$$\begin{aligned}4y + 1 + y &= 16 \\ 5y &= 15 \\ \boxed{y} &= \boxed{3}\end{aligned}$$

$$\begin{aligned}x &= 4(3) + 1 \\ x &= 12 + 1 \\ \boxed{x} &= \boxed{13}\end{aligned}$$

52. The width of a certain rectangle is 2 meters greater than half the length. Four times its length is 26 meters greater than its perimeter. What are the dimensions of the rectangle?

$$\begin{aligned}w &= \frac{1}{2}l + 2 \\ p &= 4l - 26 \\ p &= 2l + 2w\end{aligned}$$

$$\begin{aligned}p &= 2l + 2\left(\frac{1}{2}l + 2\right) \\ p &= 3l + 4 \\ 4l - 26 &= 3l + 4 \\ \boxed{l} &= \boxed{30}\end{aligned}$$

$$\begin{aligned}p &= 4(30) - 26 \\ p &= 94 \\ 94 &= 2(30) + 2w \\ 34 &= 2w \\ \boxed{w} &= \boxed{17}\end{aligned}$$

In examples #53 and 54, write a system of two equations with two variables and solve each problem.

53. The difference between three times one number and a lesser one is 37. The sum of the greater number and twice the lesser number is 38. Find the numbers.

$$\begin{cases} 3x - y = 37 \\ x + 2y = 38 \Rightarrow x = 38 - 2y \end{cases}$$

$$3(38 - 2y) - y = 37$$

$$114 - 6y - y = 37$$

$$114 - 7y = 37$$

$$-7y = -77$$

$$\boxed{y} = \boxed{11}$$

$$3x - 11 = 37$$

$$3x = 48$$

$$\boxed{x} = \boxed{16}$$

54. The length of a rectangular garden is three times the width. If the perimeter is 32 meters, what are the dimensions of the garden?

$$\begin{cases} l = 3w \\ 32 = 2l + 2w \end{cases}$$

$$l = 3(4)$$

$$\boxed{l} = \boxed{12}$$

$$32 = 2(3w) + 2w$$

$$32 = 6w + 2w$$

$$32 = 8w$$

$$\boxed{w} = \boxed{4}$$