

#1-14
@ 25 min

Fast Math Geometry – Summer Assignment

Name: Key

#15-34
@ 25 min

Section I: Solving Linear Equations

Solve and check each equation. Show all work and circle your answer.

1. $\frac{x}{5} - 2 = 2$
 $\frac{x}{5} = 4$

$x = 20$

Check
 $\frac{20}{5} - 2$
 $4 - 2$
 $2 \checkmark$

3. $12x \left(\frac{5}{6}v - \frac{1}{3} \right) = \left(\frac{3}{4}v + \frac{1}{6} \right) \times 12$

$10v - 4 = 9v + 2$

$v = 6$

Check
 $5 - \frac{1}{3} = \frac{9}{2} + \frac{1}{6}$
 $\frac{15}{3} - \frac{1}{3} = \frac{27}{6} + \frac{1}{6}$
 $\frac{14}{3} = \frac{28}{6} \checkmark$

2. $d - 3d + 13 = 7d - (d + 3)$

$-2d + 13 = 7d - d - 3$

$-2d + 13 = 6d - 3$

$-8d = -16$

$d = 2$

Check

$2 - 6 + 13 = 14 - (5)$

$-4 + 13 = 9$

$9 = 9 \checkmark$

4. $3(2y - 8) = 4 - 2(3y - 4)$

$6y - 24 = 4 - 6y + 8$

$12y = 36$

$y = 3$

Check

$3(6 - 8) = 4 - 2(9 - 4)$

$3(-2) = 4 - 2(5)$

$-6 = 4 - 10 \checkmark$

Solve for the indicated variable.

5. $9x - 3y = 10$ for y

$\frac{-9x}{-3} = \frac{-9x + 10}{-3}$

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

6. $y = mx + b$ for x

$\frac{y - b}{m} = \frac{mx}{m}$

$x = \frac{y - b}{m}$

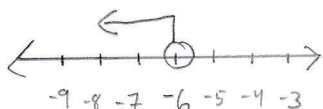
Section II: Solving Inequalities

Solve and check each inequality. Graph the solution on a number line.

7. $-7y + 9 > 51$

$\frac{-7y}{-7} > \frac{42}{-7}$

$y < -6$



Check

$y = -7$

$49 + 9 > 51$
 $58 > 51 \checkmark$

$y = -5$

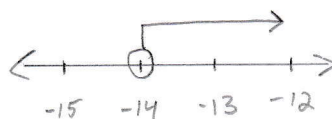
$35 + 9 > 51$
 $44 > 51$

8. $5(x - 4) < 6x + 8 + x$

$5x - 20 < 7x + 8$

$\frac{-2x}{-2} < \frac{28}{-2}$

$x > -14$



Check

$x = -15$

$5(-15) < -90 + 8 + (-15)$

$-95 < -97$ X

$x = -13$

$5(-17) < -78 + 8 + (-13)$

$-85 < -83 \checkmark$

9. $-3x+2 > 14$ or $7x-8 \geq -1$

$-3x > 12$ or $7x \geq 7$

$x < -4$ or $x \geq 1$

Check

$x = -5$

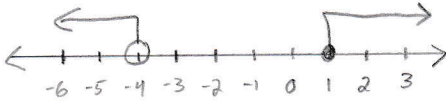
$15 + 2 > 14$
 $17 > 14 \checkmark$

$x = 0$

$0 + 2 > 14$
 $2 > 14 \times$

$x = 2$

$14 - 8 \geq -1$
 $6 \geq -1 \checkmark$



10. $\frac{1}{2}y + 8 \leq 9$ and $-\frac{2}{3}y + 6 < 10$

$\frac{1}{2}y \leq 1$ and $-\frac{2}{3}y < 4$

$y \leq 2$ and $y > -6$

$-6 < y \leq 2$

Check

$y = -9$

$-\frac{2}{3}(-9) + 6 < 10$
 $6 + 6 < 10$
 $12 < 10 \times$

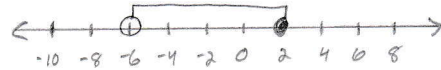
$y = 0$

$0 + 8 \leq 9$ and $0 + 6 < 10$
 $8 \leq 9 \checkmark$ $6 < 10 \checkmark$

$y = 4$

$\frac{1}{2}(4) + 8 \leq 9$
 $2 + 8 \leq 9$
 $10 \leq 9 \times$

$I = 2$



Section III: Solving Systems of Equations

Solve and check each system of equations.

11.
$$\begin{cases} \textcircled{1} x - y = 5 \\ \textcircled{2} 3x + y = 3 \end{cases}$$

+

 $4x = 8$
 $x = 2$

→ $\textcircled{1} 2 - y = 5$
 $-y = 3$
 $y = -3$

$(2, -3)$

$\textcircled{1} 2 - (-3) = 5 \checkmark$

$\textcircled{2} 6 + (-3) = 3 \checkmark$

12.
$$\begin{cases} \textcircled{1} 2x + 4y = 26 \\ \textcircled{2} x + y = 8 \end{cases}$$

$\xrightarrow{x \cdot (-2)}$

 $-2x - 2y = -16$

+

 $2y = 10$
 $y = 5$

$\textcircled{2} x + 5 = 8$
 $x = 3$

$(3, 5)$

$\textcircled{1} 6 + 20 = 26 \checkmark$

$\textcircled{2} 3 + 5 = 8 \checkmark$

13.
$$\begin{cases} \textcircled{1} 3x + 2y = 10 \\ \textcircled{2} -7x + 2y = 30 \end{cases}$$

$\xrightarrow{x \cdot (-1)}$

 $-7x - 2y = -30$

+

 $10x = -20$
 $x = -2$

$\textcircled{1} -6 + 2y = 10$
 $2y = 16$
 $y = 8$

$(-2, 8)$

$\textcircled{1} -6 + 16 = 10 \checkmark$

$\textcircled{2} 14 + 16 = 30 \checkmark$

14.
$$\begin{cases} \textcircled{1} 9x - 8y = 4 \\ \textcircled{2} 2x - 3y = -4 \end{cases}$$

$\xrightarrow{x \cdot 2}$
 $18x - 16y = 8$

$\xrightarrow{x \cdot (-9)}$

 $-18x + 27y = 36$

+

 $11y = 44$
 $y = 4$

$\textcircled{2} 2x - 12 = -4$
 $2x = 8$
 $x = 4$

$(4, 4)$

$\textcircled{1} 36 - 32 = 4 \checkmark$

$\textcircled{2} 8 - 12 = -4 \checkmark$

Section IV: Simplifying Polynomials

Add, subtract, or multiply as indicated. Write each answer in simplest form.

15. $(6c+4d-2)+(-3c-8d+2)$

$$\boxed{3c-4d}$$

16. $(w^2-8w+2)-(-5w^2+7w+3)$

$$w^2-8w+2+5w^2-7w-3$$

$$\boxed{6w^2-15w-1}$$

17. $(5x+3)(3x-2)$

$$15x^2-10x+9x-6$$

$$\boxed{15x^2-x-6}$$

18. $(x-7)(x+7)$

$$x^2+7x-7x-49$$

$$\boxed{x^2-49}$$

19. $(2x-5)^2$

$$(2x-5)(2x-5)$$

$$4x^2-10x-10x+25$$

$$\boxed{4x^2-20x+25}$$

20. $(2x^2-5)(2x^2-x+5)$

$$(2x^2-5)(2x^2)+(2x^2-5)(-x)+(2x^2-5)(5)$$

$$4x^4-10x^2+(-2x^3)+5x+10x^2-25$$

$$\boxed{4x^4-2x^3+5x-25}$$

Section V: Factoring Polynomials

Factor if possible. If not, write prime.

21. $6j^2-3jkm$

$$\boxed{3j(2j-km)}$$

22. $m^2-7m+12$

$$\boxed{(m-4)(m-3)}$$

$\times 12$	$ +(-7)$
$(-4)(-3)$	$ \checkmark$

23. $v^2-18v+36$

$$\boxed{\text{Prime}}$$

$\times 36$	$ +(-18)$

24. $6x^2+x-15$

$$(6x^2-9x)+(10x-15)$$

$$3x(2x-3)+5(2x-3)$$

$$\boxed{(2x-3)(3x+5)}$$

$\times (-90)$	$ +(1)$
$(-9)(10)$	$ \checkmark$

25. $4xy+x+12y+3$

$$(4xy+x)+(12y+3)$$

$$x(4y+1)+3(4y+1)$$

$$\boxed{(4y+1)(x+3)}$$

26. $27p^3-75p$

$$3p(9p^2-25)$$

$$3p[(3p)^2-(5)^2]$$

$$\boxed{3p(3p-5)(3p+5)}$$

Section VI: Solving Equations by Factoring

Solve by factoring. Check your solution(s).

27. $x^2 + 10x - 39 = 0$

$$\frac{x(-39) \mid +10}{(-3)(13) \mid \checkmark}$$

$$(x-3)(x+13) = 0$$

$$x-3 = 0 \text{ or } x+13 = 0$$

$$x = 3 \quad x = -13$$

Check

$$x = -13$$

$$169 + (-430) - 39 = 0$$

$$39 - 39 = 0 \checkmark$$

$$x = 3$$

$$9 + 30 - 39 = 0$$

$$39 - 39 = 0 \checkmark$$

$x = -13, 3$

28. $x^2 + 16 = 52$

$$x^2 - 36 = 0$$

$$(x)^2 - (6)^2 = 0$$

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

$$x-6 = 0 \text{ or } x+6 = 0$$

$$x = 6 \quad x = -6$$

Check

$$x = -6$$

$$36 + 16 = 52 \checkmark$$

$$x = 6$$

$$36 + 16 = 52 \checkmark$$

$x = \pm 6$

29. $2x^2 - 5x = 3$

$$2x^2 - 5x - 3 = 0$$

$$(2x^2 - 6x) + (x - 3) = 0$$

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

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

$$x-3 = 0 \text{ or } 2x+1 = 0$$

$$x = 3 \quad x = -\frac{1}{2}$$

Check

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

$$2\left(\frac{1}{4}\right) - \left(-\frac{5}{2}\right) = 3$$

$$\frac{1}{2} + \frac{5}{2} = 3$$

$$\frac{6}{2} = 3 \checkmark$$

$$x = 3$$

$$2(9) - 15 = 3$$

$$18 - 15 = 3 \checkmark$$

$x = -\frac{1}{2}, 3$

30. $x^2 = 5 - 4x$

$$x^2 + 4x - 5 = 0$$

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

$$x-1 = 0 \text{ or } x+5 = 0$$

$$x = 1 \quad x = -5$$

Check

$$x = -5$$

$$25 = 5 - (-20)$$

$$25 = 5 + 20 \checkmark$$

$$x = 1$$

$$1 = 5 - 4 \checkmark$$

$x = -5, 1$

31. $16x^2 = 24x$

$$16x^2 - 24x = 0$$

$$8x(2x-3) = 0$$

$$8x = 0 \text{ or } 2x-3 = 0$$

$$x = 0 \quad x = \frac{3}{2}$$

Check

$$x = 0$$

$$0 = 0 \checkmark$$

$$x = \frac{3}{2}$$

$$16\left(\frac{9}{4}\right) = 24\left(\frac{3}{2}\right)$$

$$36 = 36 \checkmark$$

$x = 0, \frac{3}{2}$

32. $x^2 = 77 + 4x$

$$x^2 - 4x - 77 = 0$$

$$(x-11)(x+7) = 0$$

$$x-11 = 0 \text{ or } x+7 = 0$$

$$x = 11 \quad x = -7$$

Check

$$x = -7$$

$$49 = 77 + (-28) \checkmark$$

$$x = 11$$

$$121 = 77 + 44 \checkmark$$

$x = -7, 11$

33. $2x^2 + 3x = 20$

$$2x^2 + 3x - 20 = 0$$

$$(2x^2 - 5x) + (8x - 20) = 0$$

$$x(2x-5) + 4(2x-5) = 0$$

$$(2x-5)(x+4) = 0$$

$$2x-5 = 0 \text{ or } x+4 = 0$$

$$x = \frac{5}{2} \quad x = -4$$

Check

$$x = -4$$

$$2(16) + (-12) = 20$$

$$32 + (-12) = 20 \checkmark$$

$$x = \frac{5}{2}$$

$$2\left(\frac{25}{4}\right) + \frac{15}{2} = 20$$

$$\frac{25}{2} + \frac{15}{2} = 20$$

$$\frac{40}{2} = 20 \checkmark$$

$x = -4, \frac{5}{2}$

34. $3x^2 + 2x = 5$

$$3x^2 + 2x - 5 = 0$$

$$(3x^2 - 3x) + (5x - 5) = 0$$

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

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

$$x-1 = 0 \text{ or } 3x+5 = 0$$

$$x = 1 \quad x = -\frac{5}{3}$$

Check

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

$$3\left(\frac{25}{9}\right) + \left(-\frac{10}{3}\right) = 5$$

$$\frac{25}{3} + \left(-\frac{10}{3}\right) = 5$$

$$\frac{15}{3} = 5 \checkmark$$

$$x = 1$$

$$3 + 2 = 5 \checkmark$$

$x = -\frac{5}{3}, 1$