Geometry and Algebra with Transformations
Algebra One Review

Equation Solving

1. $\frac{3}{7}x - 12 = 30$

$\frac{7}{3}\left(\frac{3}{7}x = 42\right)\frac{7}{3}$

$x = 98$

2. $\frac{4}{11}x + 23 = x - 19$

$-\frac{4}{11}x + 19 \quad -\frac{4}{11}x + 19$

$42 = \frac{7}{11}x$

$\left(\frac{11}{7}\right)42 = x$

$66 = x$

3. $4 - 8(x - 4) = 2 + 6(3 - x)$

$4 - 8x + 32 = 2 + 18 - 6x$

$-8x + 36 = 20 - 6x$

$-2x = -16$

$x = 8$

4. $2\{3 - 4(3x - 6)\} = 12$

$2\{3 - 12x + 24\} = 12$

$2\{27 - 12x\} = 12$

$54 - 24x = 12$

$-24x = -42$

$x = -1.75$

5. $(x - 3)^2 = 81$

$x - 3 = \pm 9$

$x - 3 = 9 \quad x - 3 = -9$

$x = 12 \quad x = -6$

6. $13 = \frac{5}{13}(4 - 2x)^2$

$\frac{169}{5} = (4 - 2x)^2$

$\pm 5.81 \approx 4 - 2x$

$5.81 \approx 4 - 2x \quad -5.81 \approx 4 - 2x$

$1.81 \approx -2x \quad -9.81 \approx -2x$

$-0.91 \approx x \quad 4.91 \approx x$

Systems of Equations

7. $5x + 7y = 11$
$8y - 4x = 100$

$20x + 28y = 44$

$-20x + 40y = 500$

$68y = 544$

$y = 8$

$5x + 7(8) = 11$

$5x + 56 = 11$

$5x = -45$

$x = -9$

$(-9, 8)$

8. $y = 6 - 5x$
$6y - 12 = 3(2x + 4y)$

$6y - 12 = 6x + 12y$

$\frac{-6y - 12 = 6x}{6}$

$-y - 2 = x$

$y = 6 - 5(-y - 2)$

$y = 6 + 5y + 10$

$-4y = 16$

$y = -4$

$-(-4) - 2 = x$

$2 = x$

$(2, -4)$

9. $2(3x + 5y) = 4x - 36$
$4 - 5(3x + y) = 11y - 21$

$6x + 10y = 4x - 36$

$\frac{2x + 10y = -36}{2}$

$x + 5y = -18$

$4 - 15x - 5y = 11y - 21$

$-15x - 16y = -25$

$15x + 75y = -270$

$59y = -295$

$y = -5$

$x + 5(-5) = -18$

$x = 7$

$(7, -5)$

Exponents

10. $(2x + 4)(4x - 9)$

$8x^2 - 18x + 16x - 36$

$8x^2 - 2x - 36$

11. $(2x + 4)^2$

$(2x+4)(2x+4)$

$4x^2 + 8x + 8x + 16$

$4x^2 + 16x + 16$

12. $(4x^6)^2$

$16x^{12}$

13. $(3x^4)^3$

$27x^{12}$

14. $\frac{20x^6}{5x^3}$

$4x^3$

15. $\frac{20x^6}{30x^{10}}$

$\frac{2}{3x^4}$

16. $x^5 + x^5$

$2x^5$

17. $x^5 - x^5$

0

18. $(x^5)^5$

x^{25}

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

x^{10}

20. $3x^2(2x - 5)^2$

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

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

$12x^4 - 60x^3 + 75x^2$

21. $(4x^5)(-6x^{10})$

$-24x^{15}$

22. $(3x^4)(2x^6)^3$

$(3x^4)(8x^{18})$

$24x^{22}$

Writing Equations of Functions

23. Write the equation of a line that contains the point (-9,4) with a slope of $\frac{1}{6}$

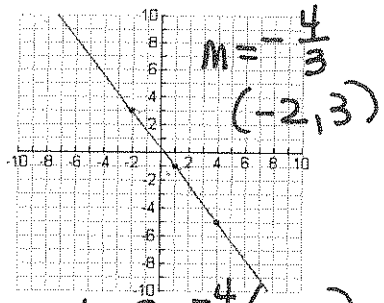
$y - 4 = \frac{1}{6}(x + 9)$

24. Write the equation of a line that contains the points (-5,9) and (5, -10)

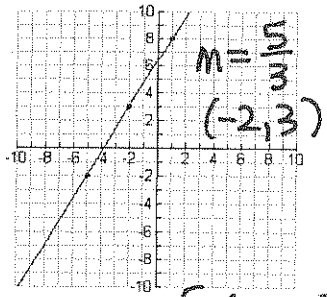
$m = \frac{\Delta y}{\Delta x} = \frac{9 - -10}{-5 - 5} = \frac{19}{-10}$

$y - 9 = \frac{19}{-10}(x + 5)$

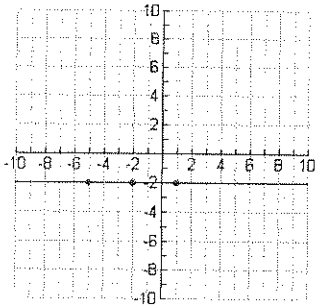
25. Write the equation of these lines



$y - 3 = -\frac{4}{3}(x + 2)$



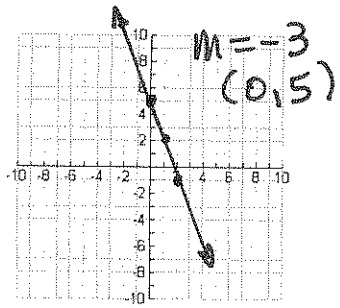
$y - 3 = \frac{5}{3}(x + 2)$



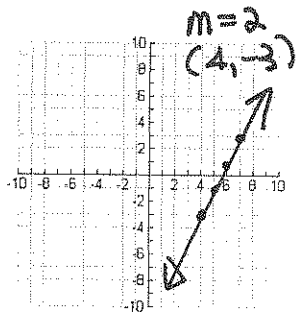
$y = -2$

26. Graph these functions

A. $y = -3x + 5$



B. $y + 3 = 2(x - 4)$



C. $y = \frac{-2}{5}(x + 3)$