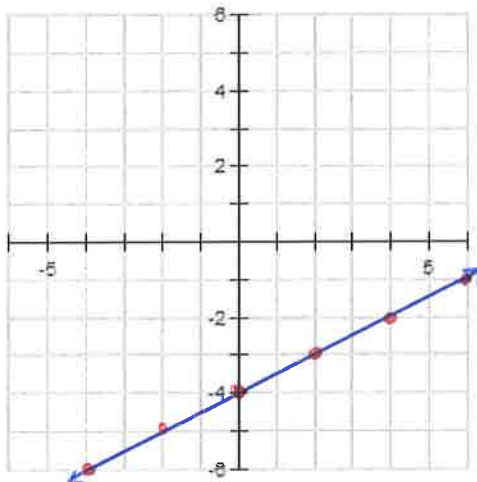


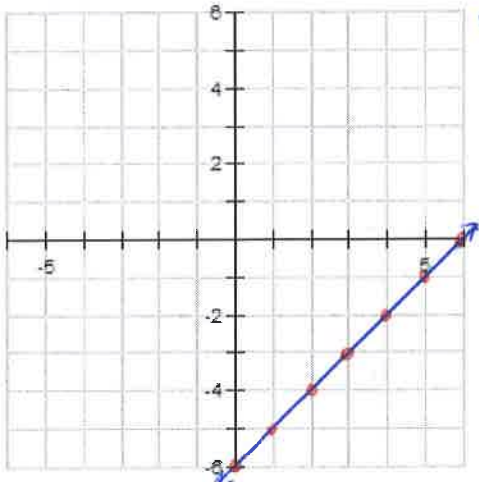
REVIEW OF THE FUNDAMENTALS OF ALGEBRA

PART 1: Graphing Linear Equations

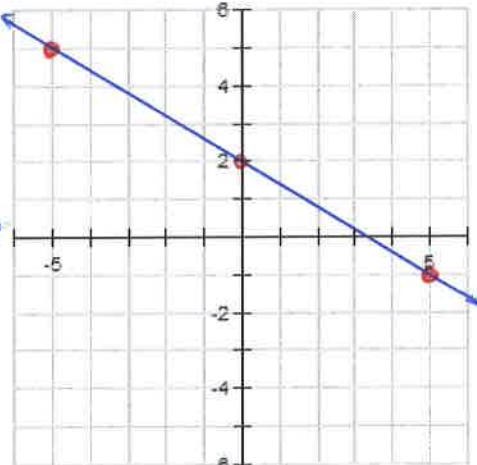
1.) $y = \frac{1}{2}x - 4$



2.) $3x - 3y = 18 \rightarrow y = x - 6$



3.) $3x + 5y = 10 \rightarrow y = -\frac{3}{5}x + 2$



PART 2: Evaluating & Graphing Piecewise Functions

$$f(x) = \begin{cases} x + 1, & x < -2 \\ 2, & -2 \leq x < 3 \\ -2x + 4, & x \geq 3 \end{cases}$$

4.) $f(4) = \underline{-4}$

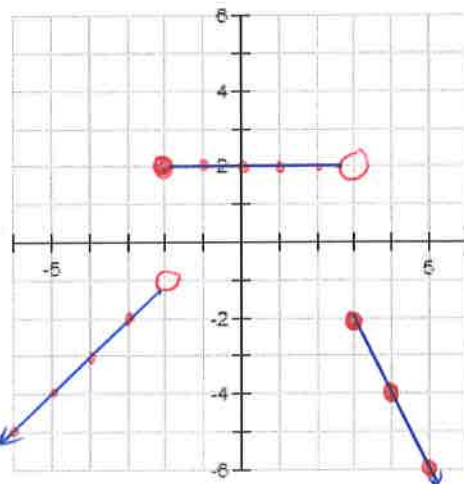
5.) $f(3) = \underline{-2}$

6.) $f(-3) = \underline{-2}$

7.) $f(-2) = \underline{2}$

8.) $f(1) = \underline{2}$

9.) $f(0) = \underline{2}$



PART 3: Writing Equations of Lines

10.) Write the equation of the line in slope-intercept form which has a slope of $\frac{1}{2}$ and passes through $(6, 4)$.

$y = \frac{1}{2}x + 1$

11.) Write the equation of the line in slope-intercept form which passes through $(6, 1)$ and $(8, -4)$.

$y = -\frac{5}{2}x + 16$

12.) Write the equation of the line in slope-intercept form that passes through $(-2, 0)$ and is perpendicular to the line whose equation is $y = 3x + 7$.

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

13.) Determine whether the lines passing through the given points are parallel, perpendicular or neither.

$L_1: (-3, 2), (6, -1) \quad m = -\frac{1}{3}$

$L_2: (2, 2), (-1, -7) \quad m = 3$

\Rightarrow PERPENDICULAR

PART 4: Exponent Properties

14.) $\left(\frac{a^3 b^{-1}}{b^2}\right)^2$ $\frac{a^6}{b^6}$

15.) $(\sqrt[5]{x})^3$ $x^{\frac{3}{5}}$

16.) $\frac{x^5 y^0 z^3}{xyz^5}$ $\frac{x^4}{yz^2}$

17.) $3^4 \cdot 3^4 \cdot 3^3$ 3^{11}
OR 177,147

18.) $(2^{-1})^{-3}$ 2^3
OR 8

19.) $\frac{vu^3}{(uv^2)^2 \cdot 2u^3 v^2}$ $\frac{1}{2u^4 v^5}$

PART 5: Simplifying Radicals

20.) $6\sqrt{75}$ $30\sqrt{3}$

21.) $8\sqrt{192u^5 v^4}$
 $64u^2 v^2 \sqrt{3u}$

22.) $\sqrt{\frac{12}{5}}$ $\frac{2\sqrt{15}}{5}$

23.) $\frac{6}{3\sqrt{8}}$ $\frac{\sqrt{2}}{2}$

24.) $(2\sqrt{3x})(3\sqrt{7x^2})$
 $6x\sqrt{21x}$

25.) $(3\sqrt{10y})^2$ $90y$

PART 6: Complex Numbers

26.) $(4 - 3i)(2 + 2i)$
 $14 + 2i$

27.) $\frac{3+2i}{i}$ $2 - 3i$

28.) $\frac{7-3i}{4+i}$
 $\frac{25-19i}{17}$

PART 7: Factoring Techniques

29.) $6x - 12x^2$
 $6x(1-2x)$

30.) $16x^2 - 25$
 $(4x+5)(4x-5)$

31.) $x^2 - 14x - 32$
 $(x-16)(x+2)$

32.) $x^2 - 9x + 20$
 $(x-5)(x-4)$

33.) $4x^2 - 4x - 3$
 $(2x-3)(2x+1)$

34.) $9x^2 - 13x + 4$
 $(9x-4)(x-1)$

35.) $6x^2 - 13x + 6$
 $(3x-2)(2x-3)$

36.) $5x^2 - 14x + 8$
 $(5x-4)(x-2)$

37.) $x^3 + 27$
 $(x+3)(x^2-3x+9)$

38.) $x^5 - 3x^3 + x^2 - 3$
 $(x^2-3)(x^3+1)$

$f(x) = x + 2$	$g(x) = 2x - 5$	$h(x) = x^2 + 6$	$j(x) = \sqrt{x^2 - 4}$
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PART 10: Function Operations [Use table above]

49.) $(f + g)(x) =$

$3x - 3$

50.) $(h - f)(x) =$

$x^2 - x + 4$

51.) $(f \cdot g)(x) =$

$2x^2 - x - 10$

52.) $\left(\frac{j}{g}\right)(x) =$

$\frac{\sqrt{x^2 - 4}}{2x - 5}$

53.) $(h - g)(3) =$

14

54.) $\left(\frac{j}{f}\right)(-2) =$

UNDEFINED

PART 11: Composition of Functions [Use table above]

55.) $(h \circ f)(x) =$

$x^2 + 4x + 10$

56.) $(h \circ j)(x) =$

$x^2 + 2$

57.) $(g \circ g)(x) =$

$4x - 15$

58.) $(h \circ g)(3) =$

7

59.) $(j \circ h)(-2) =$

$4\sqrt{6}$

60.) $(f \circ f)(4) =$

8

PART 12: Inverse Functions

61.) $f(x) = \frac{1}{2}x^3 + 4$

$f^{-1}(x) = \sqrt[3]{2x - 8}$

62.) $f(x) = \frac{x+1}{x-2}$

$f^{-1}(x) = \frac{2x+1}{x-1}$

63.) $f(x) = \frac{6x+4}{4x+5}$

$f^{-1}(x) = \frac{-5x+4}{4x-6}$

PART 13: Polynomial Division

64.) $(3x^3 - 17x^2 + 15x - 25) \div (x - 5)$

$3x^2 - 2x + 5$

65.) $(5x^3 + 6x + 8) \div (x + 2)$

$5x^2 - 10x + 26 - \frac{44}{x+2}$

66.) $(x^4 + 3x^2 + 1) \div (x^2 - 2x + 3)$

$x^2 + 2x + 4 + \frac{2x-11}{x^2-2x+3}$

67.) $(9x^3 - 16x - 18x^2 + 32) \div (x - 2)$

$9x^2 - 16$

PART 8: Solving each equation.

39.) $4x^2 = 16x$

$$x=0$$

$$x=4$$

40.) $x^2 - 2x + 9 = 0$

$$x = 1 \pm 2i\sqrt{2}$$

41.) $92 - 42x = 2x^2$

$$x = -23$$

$$x = 2$$

42.) $x(x - 2) = 4$

$$x = 1 \pm \sqrt{5}$$

43.) $\frac{x}{x-3} = \frac{4}{x-4}$

$$x=6$$

$$x=2$$

44.) $\frac{x-4}{3} = \frac{x+4}{x+1}$

$$x=8$$

$$x=-2$$

PART 9: Find the roots of each equation.

45.) $5x = 3 - 3x^2$

$$x = \frac{-5 \pm \sqrt{61}}{6}$$

46.) $x^2 - x - 30 = 0$

$$x = -5$$

$$x = 6$$

47.) $2x^2 - x = 5$

$$x = \frac{1 \pm \sqrt{41}}{4}$$

48.) $3x^2 + 13x = -4$

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

$$x = -4$$