Pre-Calculus Chapter#1 Review

Name Answer Key

Period# ____

1. Find the indicated set if

   A={3, 4, 5, 6, 7, 8, 9}

   B={4, 6, 8, 10}

   C={8, 9, 10, 11}

   (a) $A \cap C = \{8, 9\}$

   (b) $A \cup B \cup C = \{3, 4, 5, 6, 7, 8, 9, 10, 11\}$

   (c) $A \cap B \cap C = \{8\}$

2. Simplify $\left(12a^{15}b^3c^6\right)\left(\frac{2a^4b^2}{c^3}\right)^{-5}$

2^{-5}

$12a^{15}b^3c^6\left(\frac{c^3}{2a^4b^2}\right)^5$

$12a^{15}b^3c^6 \cdot \frac{c^{15}}{32a^{20}b^{10}} = \frac{3c^{21}}{8a^5b^7}$

3. Simplify $\frac{5a^3b^2c^{-3}}{\left(a^{-2}b^3c\right)^2}$

$\frac{5a^3b^2c^{-3}}{a^{-4}b^6c^2} = \frac{5a^7}{b^4c^5}$

4. Evaluate $\left(\frac{125}{8}\right)^{-\frac{1}{3}} = \left(\frac{8}{125}\right)^{\frac{1}{3}} = \frac{2}{5}$

5. Evaluate $\left(9x^6y^8\right)^{\frac{3}{2}}$

$\left(\sqrt{9x^6y^8}\right)^3$

$(3x^3y^4)^3$

$27x^9y^{12}$

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

$6x^3-8x^2+3x^2-4x-15x+20$

$6x^3-5x^2-19x+20$

7. Factor x^2-6x+5

$-5 \cdot -1 = 5$, $-5 + -1 = -6$

$(x-5)(x-1)$

8. Factor $3x^2+13x+12$

$3 \cdot 12 = 36$, $9 + 4 = 13$

$(x+3)(3x+4)$

9. Factor $8x^3+y^3$ $(A+B)(A^2-AB+B^2)$

$(2x+y)(4x^2-2xy+y^2)$

10. Factor $4x^2-9$

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

11. Find all real solutions to the equation.

$x^3-9x^2+18x=0$

$x(x^2-9x+18)=0$

$-6 \cdot -3 = 18$, $-6 + -3 = -9$

$x(x-6)(x-3)=0$

$x=0 \quad x-6=0 \quad x-3=0$

$x=0 \quad x=6 \quad x=3$

12. Solve by completing the square

$x^2+4x-12=0$

$x^2+4x+\underline{4} = 12+\underline{4}$

$2 \cdot 2 = 4$, $2+2=4$

$\frac{4}{2} \rightarrow 2^2$

$\sqrt{(x+2)^2} = \sqrt{16}$

$x+2 = \pm 4$

$x+2=4$ $\quad x=2$

$x+2=-4$ $\quad x=-6$

13. Solve the quadratic equation

$-5x = x^2 - 9$

$x^2+5x-9=0$

$a=1\ b=5\ c=-9$

$\frac{-5 \pm \sqrt{5^2-4(1)(-9)}}{2(1)}$

$\frac{-5 \pm \sqrt{25+36}}{2}$

$\boxed{\frac{-5 \pm \sqrt{61}}{2}}$

14. Simplify $\frac{x^3+7x^2+10x}{x^2+8x+15}$

$\frac{x(x^2+7x+10)}{(x+3)(x+5)} = \frac{x(x+5)(x+2)}{(x+3)(x+5)}$

$= \boxed{\frac{x(x+2)}{(x+3)}}$

15. Simplify $\frac{2x+2}{4x^2-49} \div \frac{x^2-6x-7}{2x^2-7x-49}$

$\frac{2(x+1)}{(2x+7)(2x-7)} \cdot \frac{(2x+7)(x-7)}{(x-7)(x+1)}$

-98, $2x$, -7, 14, 7, -7

$\boxed{\frac{2}{(2x-7)}}$

16. Simplify $\frac{x+1}{x+2} + \frac{5}{x^2+5x+6}$

$\frac{(x+1)(x+3)}{(x+2)(x+3)} + \frac{5}{(x+3)(x+2)}$

$\frac{(x^2+x+3x+3)+5}{(x+2)(x+3)} = \boxed{\frac{x^2+4x+8}{(x+2)(x+3)}}$

17. Find all real solutions of the equation

$2|x+5|-3<13$

$+3 \quad +3$

$\frac{2}{2}|x+5| < \frac{16}{2}$

$|x+5| < 8$

$\boxed{-13 < x < 3}$

$x+5 < 8 \quad -5 \quad -5$

$\boxed{x < 3}$

$x+5 > -8 \quad -5 \quad -5$

$\boxed{x > -13}$

18. Solve the inequality. Express the solution as an interval and graph.

$-1 < 2x-5 \le 7$

$+5 \quad +5 \quad +5$

$\frac{4}{2} < \frac{2x}{2} \le \frac{12}{2}$

$\boxed{2 < x \le 6}$

$\boxed{(2, 6]}$

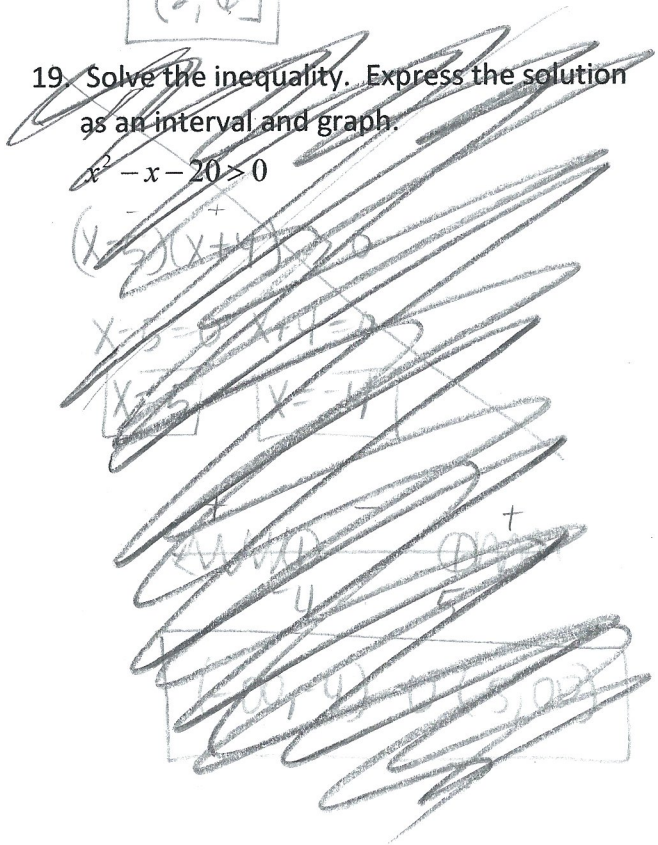
19. Solve the inequality. Express the solution as an interval and graph.

$x^2 - x - 20 > 0$

$(x-5)(x+4) > 0$

$x-5=0 \quad x+4=0$

$x=5 \quad x=-4$



13. Solve the quadratic equation

$-5x = x^2 - 9$

14. Simplify $\dfrac{x^3+7x^2+10x}{x^2+8x+15}$

15. Simplify $\dfrac{2x+2}{4x^2-49} \div \dfrac{x^2-6x-7}{2x^2-7x-49}$

16. Simplify $\dfrac{x+1}{x+2} + \dfrac{5}{x^2+5x+6}$

17. Find all real solutions of the equation

$2|x+5|-3<13$

18. Solve the inequality. Express the solution as an interval and graph.

$-1 < 2x-5 \le 7$

19. Write the domain of the given function as a interval and as a graph.

$y = \dfrac{3}{x+2}$ $x+2=0$ $x \neq -2$

$(-\infty,-2) \cup (-2,\infty)$

20. Find the slope of (-3, 2) and (4, 5)

$x_1 y_1$ $x_2 y_2$

$m = \dfrac{5-2}{4+3} = \dfrac{3}{7}$

21. Write an equation of a line that goes through the points (-1, -2) and (4,3)

$x_1 y_1$ $x_2 y_2$

$m = \dfrac{3+2}{4+1} = \dfrac{5}{5} = 1$

$y-3 = 1(x-4)$

$y-3 = x-4$

$+3 \quad +3$

$y = x-1$

21. Write an equation of a line in slope intercept form that goes through the point (5,2) and is parallel to $4x+6y+5=0$

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

$6y=-4x-5$

$y=-\frac{2}{3}x-\frac{5}{6}$

m

$y-2=-\frac{2}{3}x+\frac{10}{3}$

$+2$

$+2\cdot 3=\frac{6}{3}$

$1\cdot 3$

$y=-\frac{2}{3}x+\frac{16}{3}$

22. Write an equation of a line that goes through the point (-3,2) and is perpendicular to $4x+8y=7$

$8y=-4x+7$

$y=-\frac{1}{2}x+\frac{7}{8}$

$\perp m=2$

$y-2=2(x+3)$

$y-4=2x+6$

$+2 \quad +2$

$y=2x+8$

23. Graph $2x-3y=6$

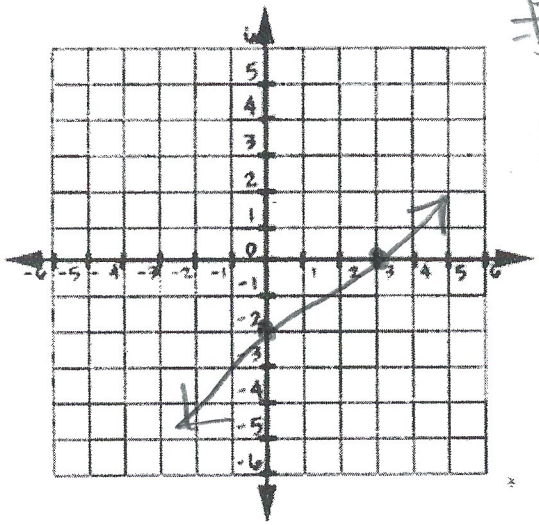
$-2x \quad -2x$

$-3y=-2x+6$

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

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

$b=-2$



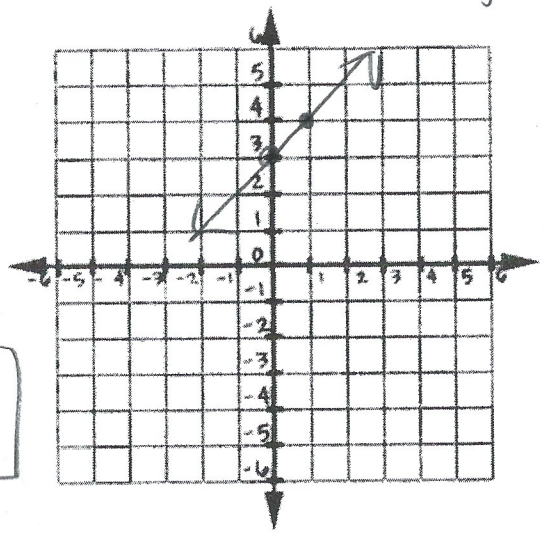
24. Graph $y-2=x+1$

$+2 \quad +2$

$y=x+3$

$m=\frac{1}{1}$

$b=3$



25. Write an equation of a line in point-slope form that passes through the point (4, -1) and is perpendicular to the y- axis.

$y=-1$