Math 4 Honors
Critical Skills Review

Name _____
Date _____

*Examples of critical algebra skills you must have mastered in order to succeed in the Calculus Units.*

Expand the following:

**1.** $(2x-9)^2$

$4x^2-36x+81$

**2.** $(x+3y)^2$

$x^2+6xy+9y^2$

**3.** $(-5x^2-6)^2$

$25x^4+60x^2+36$

Given , $f(x)=2x^2-5x-6$ evaluate and simplify the following:

4. $f(4)$

6

5. $f(-8)$

162

6. $f(x+4)$

$2x^2+11x+6$

7. $f(-4x+9)$

$32x^2-124x+111$

8. $f(7x-6)-f(x)$

$96x^2-198x+102$

9. $\dfrac{f(x-5)-f(x)}{5}$

$-4x+15$

10. $\dfrac{f(x+h)-f(x)}{h}$

$4x+2h-5$

Simplify the following, if possible.

11. $\frac{x+16}{16}$ Already simplified

12. $\frac{100x-x^2}{x}$ $100-x$

13. $\frac{x-8}{x}+1$ $\frac{2x-8}{x}$

14. $\frac{5(x+y)^2+2(x+y)-(5x^2+2x)}{y}$ $10x+5y+2$

15. $64^{\frac{1}{2}}=8$ 16. $64^{\frac{1}{3}}=4$ 17. $x^{\frac{2}{3}}=\sqrt[3]{x^2}$ 18. $x^{-5}=\frac{1}{x^5}$ 19. $\sqrt[4]{x^3}=x^{\frac{3}{4}}$ 20. $\sqrt[3]{x^5}=x^{\frac{5}{3}}$

21. Rewrite $\sqrt[7]{x^{-3}}$ so it has no roots or negative exponents.

$\frac{1}{x^{3/7}}$

22. Evaluate $8^{-\frac{2}{3}}$ without a calculator.

$\frac{1}{4}$

Calculate the following:

23. The slope of the line going though the points (-3, -8) and (10, -4). Then write the equation of the line in point-slope form.

$m=\frac{4}{13}$ $y+8=\frac{4}{13}(x+3)$ or $y+4=\frac{4}{13}(x-10)$

24. The slope of the line going though the points (-1, 6) and (12, -7). Then write the equation of the line in point-slope form.

$m=-1$ $y-6=-(x+1)$ or $y+7=-(x-12)$

Complete the following:

25. The slope of a horizontal line is zero.

26. The slope of a vertical line is undefined.

Solve the following using Number Line Analysis:

27. $b^3-6b^2+8b<b^2-4b$ $(-\infty,0)\cup(3,4)$

28. $\frac{x^2-5x-24}{x^2+9x}\geq 0$ $(-\infty,-9)\cup[-3,0)\cup[8,\infty)$