Algebra 2 Unit 5 Study Guide

1. Solve $\frac{x}{x+4}=\frac{2x}{x+3}-1$

2. Solve $\frac{x-1}{x+1}+\frac{3}{x+2}=\frac{x}{x+1}$

3. Solve $\frac{x+3}{x^2+2x-3}=1+\frac{4}{x-1}$

4. Find the sum of the expressions $\frac{x}{x^2+7x+10}+\frac{2}{x^2-4x-12}$

5. Find the sum of the expressions $\frac{2x+1}{4x-1}+\frac{x+1}{x+2}$

6. Find the difference of the expressions $\frac{x^2+x-2}{x^2+3x-10}-\frac{x}{x+1}$

7. Simplify the expressions:

a) $\frac{\sqrt[3]{4}}{\sqrt[6]{36}}-\frac{2}{\sqrt[3]{16}}$ b) $\frac{\sqrt[3]{15}}{\sqrt[3]{45}}+\frac{\sqrt[3]{75}}{\sqrt[3]{25}}$

8. Simplify the expressions with natural base e:

a) $e(e-2)\cdot\frac{1}{e}$ b) $\frac{e^2-1}{e}-\frac{e}{e+1}$ c) $\frac{e^3-1}{e-1}$

9. Graph a) $y=\frac{-1}{x-2}$ b) $y=-\frac{3}{2}\sqrt{x-1}+2$ c) $y=-2\cdot 3^{x-1}+2$

10. Let $f(x)=2x+1$, $g(x)=x-1$, $h(x)=\sqrt{x-2}$

a) Solve $f\circ h(x)=g\circ h(x)$ b) Find $m^{-1}(x)$ if $m(x)=h\circ(\frac{f}{g})(x)$ c) Evaluate $m^{-1}(3)\cdot m(3)$

11. A kind of ground squirrels' population grows exponentially. Biologists found that the squirrels mate only once a year (which means they will not make babies more than one time over a 12 month period). In a restoration habitat, biologists introduced this ground squirrel and tried to study its behaviors. They surveyed on the 2nd year, and found there were 546 squirrels. It took another 3 years for the squirrels to reach the population of 2184. With this rate, what could be the numbers of squirrels if biologists surveyed one more time at the 10th year?