

Gateway Test 1A

Name _____ Date _____

Algebra

Class _____ Section _____

1. Factor and simplify. Express the answer as a fraction without negative exponents.

$$x(x - 1)^{-1/2} + 2(x - 1)^{1/2}$$

2. Express as a simple fraction.

$$\frac{\frac{1}{y - k} - \frac{1}{y}}{k}$$

3. Multiply.

$$\left(x^{3/2} + \frac{2}{\sqrt{3}}\right)^2$$

4. Solve for x .

$$x^2 - x = 5$$

5. Find the smallest value of x that satisfies the equation.

$$|x + 5| = 3$$

6. Write the general form of the equation of the line passing through the point $(3, -1)$ with slope $\frac{5}{2}$.

7. Solve for y' .

$$xy' + y = 1 + y'$$

8. Write the equation of the circle in standard form and give the center and radius.

$$2x^2 + 2y^2 + 4x - 12y + 11 = 0$$

9. Solve for x .

$$2(x - 5)^{-1} + \frac{1}{x} = 0$$

10. Find the domain of f .

$$f(x) = \sqrt{2x + 3}$$

Gateway Test 2A

Name _____ Date _____

The Exponential and
Logarithmic Functions

Class _____ Section _____

1. Solve for
- x
- .

$$\ln(e^{7x}) = 15$$

2. Solve for
- x
- .

$$\frac{e^{x+5}}{e^5} = 3$$

3. Solve for
- x
- .

$$(e^3)^{2x} = e^3 e^{2x}$$

4. Solve for
- x
- .

$$e^{[2 \ln x - \ln(x^2 + x - 3)]} = 1$$

5. Solve for
- x
- .

$$3^{2x} - 2 \cdot 3^{(x+5)} + 3^{10} = 0$$

6. Sketch the graph of the function.

$$f(x) = e^x$$

7. Find the
- x
- intercept for the graph of the function.

$$f(x) = \ln x + 2$$

8. Use the properties of logarithms to expand the expression.

$$\ln \frac{(4x^5 - x - 1)\sqrt{x - 7}}{(x^2 + 1)^3}$$

9. Solve for
- x
- .

$$\ln x - \ln(x + 1) = 1$$

10. Find the domain of the function.

$$f(x) = \ln(3x + 2)$$

Gateway Test 3A

Name _____ Date _____

Trigonometry

Class _____ Section _____

1. If $\csc \theta = \frac{13}{5}$ and θ is in the second quadrant, find $\sec \theta$.

2. Find all θ in the interval $[0, 2\pi)$ that satisfy the equation.

$$\sin 2\theta = 0$$

3. Write the expression $\sqrt{x^2 + 4}$ in terms of θ when $x = 2 \tan \theta$.

4. Simplify $\frac{\cot \theta}{\csc \theta}$.

5. Find $\sin 2A$ if $\sin A = \frac{1}{4}$ and $0 \leq A \leq \frac{\pi}{2}$.

6. Find all θ in the interval $[0, 2\pi)$ that satisfy the equation.

$$2 \cos \theta \tan \theta + \tan \theta = 0$$

7. If $\cos 2\theta = \frac{1}{3}$ and $0 \leq 2\theta \leq \pi$, find $\cos \theta$.

8. Rewrite the given equation using the substitutions $x = r \cos \theta$ and $y = r \sin \theta$. Simplify your answer.

$$x^2 + y^2 + 3x = 0$$

9. Write the given expression in algebraic form.

$$\tan\left(\arccos \frac{x}{3}\right)$$

10. Compute $\arcsin\left(-\frac{1}{2}\right)$.