

## Gateway Test 1A

### Algebra

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 1B

### Algebra

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

$$3x(2x + 5)^{-1/2} + 3(2x + 5)^{1/2}$$

2. Express as a simple fraction.

$$\frac{\frac{3}{2(x+h)} - \frac{3}{2x}}{h}$$

3. Multiply.

$$\left(x^{5/2} + \frac{3}{\sqrt{2}}\right)^2$$

4. Solve for  $x$ .

$$x^2 - 4 = x$$

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

$$|2 - x| = 5$$

6. Write the general form of the equation of the line passing through the point  $(-2, 5)$  with slope  $-\frac{3}{4}$ .

7. Solve for  $p$ .

$$hp - 1 = q + kp + 6p$$

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

$$5x^2 + 5y^2 - 20x + 10y + 21 = 0$$

9. Solve for  $x$ .

$$3(x + 2)^{-1} - \frac{4}{x} = 0$$

10. Find the domain of  $f$ .

$$f(x) = \sqrt{5 - 3x}$$

**Test 1A**

1.  $\frac{3x-2}{\sqrt{x-1}}$     2.  $\frac{1}{y(y-h)}$   
3.  $x^3 + \frac{4}{\sqrt{3}}x^{3/2} + \frac{4}{3}$     4.  $\frac{1 \pm \sqrt{21}}{2}$   
5.  $-8$     6.  $5x - 2y + 17 = 0$     7.  $\frac{1-y}{x-1}$   
8.  $(x+1)^2 + (y-3)^2 = \frac{9}{2}$   
center:  $(-1, 3)$   
radius:  $\frac{3}{\sqrt{2}} = \frac{3\sqrt{2}}{2}$   
9.  $\frac{5}{3}$     10.  $[-\frac{3}{2}, \infty)$

**Test 1B**

1.  $\frac{3(3x+5)}{\sqrt{2x+5}}$     2.  $\frac{-3}{2x(x+h)}$   
3.  $x^5 + 3\sqrt{2}x^{5/2} + \frac{9}{2}$     4.  $\frac{1 \pm \sqrt{17}}{2}$   
5.  $-3$     6.  $3x + 4y - 14 = 0$     7.  $\frac{q+1}{h-k-6}$   
8.  $(x-2)^2 + (y+1)^2 = \frac{4}{5}$   
center:  $(2, -1)$   
radius:  $\frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$   
9.  $-8$     10.  $(-\infty, \frac{5}{3}]$