

## Math 260 Quiz # 1

Name: \_\_\_\_\_ I.D. # \_\_\_\_\_ Section # \_\_\_\_\_

Solve the following initial value problems:

1.  $y' = yx - 6x$ ,  $y(0) = 7$

$$\frac{dy}{dx} = x(y-6)$$

$$\frac{dy}{y-6} = x dx$$

Integrating both sides, we get

$$\ln|y-6| = \frac{x^2}{2} + C$$

Using the initial condition  $y(0) = 7$ , we get  $C = 0$ 

So the solution is

$$\ln|y-6| = \frac{x^2}{2}$$

2.  $y' = x\sqrt{x^2+5}$ ,  $y(-2) = 6$

$$\frac{dy}{dx} = x(x^2+5)^{\frac{1}{2}}$$

$$y = \int x(x^2+5)^{\frac{1}{2}} dx$$
$$= \frac{1}{3}(x^2+5)^{\frac{3}{2}} + C$$

Since  $y(-2) = 6 \Rightarrow \frac{1}{3}(27) + C = 6 \Rightarrow C = -3$

Hence the solution is

$$y = \frac{1}{3}(x^2+5)^{\frac{3}{2}} - 3$$