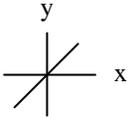
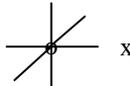
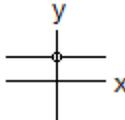
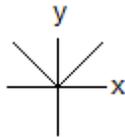
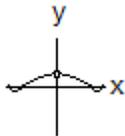
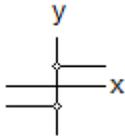
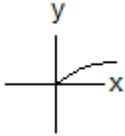
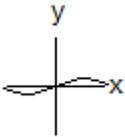


Continuity

The functions listed in the following table have different types of behaviors on an interval containing $x = 0$. For each of the functions, complete the following table:

| $y = f(x)$ | Graph of $y = f(x)$ | $f(0)$ | $\lim_{x \rightarrow 0} f(x)$ | Continuous at $x = 0$? |
|-------------------------------|---|-----------|-------------------------------|---|
| $f(x) = x$ |  | 0 | 0 | Yes, no holes, gaps, or jumps |
| $f(x) = \frac{x^2}{x}$ |  | Undefined | 0 | No, has a hole at the origin. $f(x)$ is not defined there |
| $f(x) = \frac{1}{x}$ |  | Undefined | Does Not Exist | No, it is not defined at $x = 0$ |
| $f(x) = \frac{x}{x}$ |  | Undefined | 1 | No, has a hole at the origin. $f(x)$ is not defined there |
| $f(x) = x $ |  | 0 | 0 | Yes, no holes, gaps, or jumps. The limit of $f(x)$ as x approaches 0 = $f(0)$ |
| $f(x) = \frac{\sin x}{x}$ |  | Undefined | 1 | No, has a hole at (0, 1) |
| $f(x) = \frac{ x }{x}$ |  | Undefined | Does Not Exist | No, has a hole at $x = 0$ |
| $f(x) = \sqrt{x}$ |  | 0 | Does Not Exist | No, the limit only exists from the right side |
| $f(x) = \frac{1 - \cos x}{x}$ |  | Undefined | 0 | No, hole at the origin. It is not defined at $x = 0$ |