**Theorem** The geometric distribution is a special case of the Pascal$(n, p)$ distribution when $n = 1$.

**Proof** The Pascal$(n, p)$ distribution has probability mass function

$$f(x) = \binom{n+x-1}{x} p^n (1-p)^x \qquad x = 0, 1, 2, \ldots .$$

When $n = 1$, this reduces to

$$f(x) = \binom{x}{x} p(1-p)^x = p(1-p)^x \qquad x = 0, 1, 2, \ldots ,$$

which is the probability mass function of the geometric distribution.

**APPL verification:** The APPL statements

```
NegativeBinomialRV(1,p);
GeometricRV(p);
```

both yield probability mass function

$$f(x) = p(1-p)^{x-1} \qquad x = 1, 2, \ldots .$$

Notice that these geometric distributions have support beginning at $x = 1$ rather than at $x = 0$ as in the proof.