

Write a polynomial function in standard form with zeros at  $-4$ ,  $-2$ , and  $1$ .

Solution  
(zeros)

$$x = -4$$

$$x + 4 = 0$$

$$x = -2$$

$$x + 2 = 0$$

$$x = 1$$

$$x - 1 = 0$$

Factored  
Form

$$(x + 4)(x + 2)(x - 1) = y$$

|     |       |      |
|-----|-------|------|
|     | $x$   | $4$  |
| $x$ | $x^2$ | $4x$ |
| $2$ | $2x$  | $8$  |

$$(x^2 + 6x + 8)(x - 1) = y$$

|      |        |        |      |
|------|--------|--------|------|
|      | $x^2$  | $6x$   | $8$  |
| $x$  | $x^3$  | $6x^2$ | $8x$ |
| $-1$ | $-x^2$ | $-6x$  | $-8$ |

Standard  
Form

$$x^3 + 5x^2 + 2x - 8 = y$$