

notes:

## 8.6 Factoring to solve

use the zero-product property to solve each equation.

$$1) (y+6)(y-4) = 0$$

$$y+6=0$$
$$\begin{array}{r} -6 \\ \hline \end{array}$$

$$y = -6$$

$$y-4=0$$
$$\begin{array}{r} +4 \\ \hline \end{array}$$

$$y = 4$$

$$2) (3f+2)(f-5) = 0$$

$$3f+2=0$$
$$\begin{array}{r} -2 \\ \hline \end{array}$$

$$3f = -2$$
$$\frac{3f}{3} = \frac{-2}{3}$$

$$f = -\frac{2}{3}$$

$$f-5=0$$
$$\begin{array}{r} +5 \\ \hline \end{array}$$

$$f = 5$$

$$3) (2x-7)(4x+10) = 0$$

$$2x-7=0$$

$$\begin{array}{r} +7 \\ \hline \end{array}$$

$$2x = 7$$
$$\frac{2x}{2} = \frac{7}{2}$$

$$x = \frac{7}{2}$$

$$4x+10=0$$

$$\begin{array}{r} -10 \\ \hline \end{array}$$

$$4x = -10 \div 2$$
$$\frac{4x}{4} = \frac{-10}{4} \div 2$$

$$x = -\frac{5}{2}$$

$$4) (8t-7)(3t+5) = 0$$

$$8t-7=0$$

$$\begin{array}{r} +7 \\ \hline \end{array}$$

$$8t = 7$$
$$\frac{8t}{8} = \frac{7}{8}$$

$$t = \frac{7}{8}$$

$$3t+5=0$$

$$\begin{array}{r} -5 \\ \hline \end{array}$$

$$3t = -5$$
$$\frac{3t}{3} = \frac{-5}{3}$$

$$t = -\frac{5}{3}$$

$$5) d(d-8) = 0$$

$$d = 0$$

$$d-8=0$$

$$\begin{array}{r} +8 \\ \hline \end{array}$$

$$d = 8$$

$$6) 3m(2m+9) = 0$$

$$3m = 0$$
$$\frac{3m}{3} = \frac{0}{3}$$

$$m = 0$$

$$2m+9=0$$

$$\begin{array}{r} -9 \\ \hline \end{array}$$

$$2m = -9$$
$$\frac{2m}{2} = \frac{-9}{2}$$

$$m = -\frac{9}{2}$$

$$7) (1)n^2 + (2)n(-15) = 0 \quad \text{monomi}$$

$$(n+5)(n-3) = 0$$

$$\begin{array}{r} n+5=0 \\ -5 \quad -5 \\ \hline n = -5 \end{array}$$

$$\begin{array}{r} n-3=0 \\ +3 \quad +3 \\ \hline n = 3 \end{array}$$

$$8) a^2 - 15a + 56 = 0$$

$$(a-7)(a-8) = 0$$

$$\begin{array}{r} a-7=0 \\ +7 \quad +7 \\ \hline a = 7 \end{array}$$

$$\begin{array}{r} a-8=0 \\ +8 \quad +8 \\ \hline a = 8 \end{array}$$

$$9) z^2 - 10z + 24 = 0$$

$$(z-6)(z-4) = 0$$

$$\begin{array}{r} z-6=0 \\ +6 \quad +6 \\ \hline z = 6 \end{array}$$

$$\begin{array}{r} z-4=0 \\ +4 \quad +4 \\ \hline z = 4 \end{array}$$

$$10) 8x^2 + 10x + 3 = 0$$

$$(4x+3)(2x+1) = 0$$

$$\begin{array}{r} 4x+3=0 \\ -3 \quad -3 \\ \hline 4x = -3 \\ \frac{4x}{4} = \frac{-3}{4} \\ x = -\frac{3}{4} \end{array}$$

$$\begin{array}{r} 2x+1=0 \\ -1 \quad -1 \\ \hline 2x = -1 \\ \frac{2x}{2} = \frac{-1}{2} \\ x = -\frac{1}{2} \end{array}$$

$$11) 3b^2 + 7b - 6 = 0$$

$$(3b-2)(b+3) = 0$$

$$\begin{array}{r} 3b-2=0 \\ +2 \quad +2 \\ \hline 3b = 2 \\ \frac{3b}{3} = \frac{2}{3} \\ b = \frac{2}{3} \end{array}$$

$$\begin{array}{r} b+3=0 \\ -3 \quad -3 \\ \hline b = -3 \end{array}$$

$$12) 5p^2 - 9p - 2 = 0$$

$$(5p+1)(p-2) = 0$$

$$\begin{array}{r} 5p+1=0 \\ -1 \quad -1 \\ \hline 5p = -1 \\ \frac{5p}{5} = \frac{-1}{5} \\ p = -\frac{1}{5} \end{array}$$

$$\begin{array}{r} p-2=0 \\ +2 \quad +2 \\ \hline p = 2 \end{array}$$

$$\begin{array}{l} \boxed{t=x} \\ \begin{array}{r} t \quad t \\ t \quad t \\ 0 = t - x \end{array} \end{array} \quad \begin{array}{l} \boxed{1-x} \\ \begin{array}{r} 1-1 \\ 0 = 1-x \end{array} \end{array}$$

$$0 = (t-x)(1+x)$$

$$0 = t - x - 2x \quad (1)$$

$$\begin{array}{l} \boxed{s=x} \\ \begin{array}{r} s \quad s \\ s \quad s \\ 0 = s - x \end{array} \end{array} \quad \begin{array}{l} \boxed{9=x} \\ \begin{array}{r} 9 \quad 9 \\ 9 \quad 9 \\ 0 = 9 - x \end{array} \end{array}$$

$$0 = (s-x)(9-x)$$

$$0 = 9s - 11x - 2x \quad (9)$$

$$\begin{array}{l} \boxed{s=p} \\ \begin{array}{r} s \quad s \\ s \quad s \\ 0 = s - p \end{array} \end{array} \quad \begin{array}{l} \boxed{0=p} \\ 0 = p \end{array}$$

$$0 = (s-p)p$$

$$0 = ps - 2p$$


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$$ps - ps = 2p \quad (15)$$

$$\begin{array}{l} \boxed{s=s} \\ \begin{array}{r} s \quad s \\ s \quad s \\ 0 = s - s \end{array} \end{array} \quad \begin{array}{l} \boxed{h=s} \\ \begin{array}{r} h \quad h \\ h \quad h \\ 0 = h - s \end{array} \end{array}$$

$$0 = (s-h)(s-h)$$

$$\begin{array}{l} \boxed{w=3} \\ \begin{array}{r} w \quad w \\ w \quad w \\ 0 = w - 3 \end{array} \end{array} \quad \begin{array}{l} \boxed{w=4} \\ \begin{array}{r} w \quad w \\ w \quad w \\ 0 = w - 4 \end{array} \end{array}$$

$$0 = (w-3)(w+4)$$

$$0 = w^2 + w - 12 = 0$$

$$s^2 - 12s + 32 = 0$$


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$$s^2 - 12s = -32$$

$$w^2 + w - 12 = 0$$

$$w^2 + w = 12$$

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