

1. Multiply.

a.  $(x+3)(x+4)$

$$\begin{aligned} x^2 + 3x + 4x + 12 &= \\ x^2 + 7x + 12 & \end{aligned}$$

b.  $5(y-6)(4y-1)$

$$\begin{aligned} 5(4y^2 - y - 24y + 6) &= \\ 20y^2 - 125y + 30 & \end{aligned}$$

c.  $(x - \frac{2}{5})(x + \frac{1}{5})$

$$\begin{aligned} x^2 + \frac{1}{5}x - \frac{2}{5}x - \frac{2}{25} &= \\ = x^2 - \frac{1}{5}x - \frac{2}{25} & \end{aligned}$$

d.  $(5a+2)^2 = (5a+2)(5a+2)$

$$\begin{aligned} 25a^2 + 10a + 10a + 4 &= \\ 25a^2 + 20a + 4 & \end{aligned}$$

e.  $(3x - \frac{1}{2})(3x + \frac{1}{2})$

$$\begin{aligned} 9x^2 - \frac{3}{2}x + \frac{3}{2}x - \frac{1}{4} &= \\ = 9x^2 - \frac{1}{4} & \end{aligned}$$

f.  $(6r-2x)(6r+2x)$

$$36r^2 - 4x^2$$

g.  $(x^5+5)(x^2-8)$

$$x^7 - 8x^5 + 5x^2 - 40$$

h.  $(x+3)(x^2-6x+1)$

$$\begin{aligned} x^3 - 6x^2 + x + 3x^2 - 18x + 3 &= \\ x^3 - 3x^2 - 17x + 3 & \end{aligned}$$

i.  $(y-12)(y+4)$

$$y^2 + 4y - 12y - 48 = y^2 - 8y - 48$$

j.  $2(x-11)(2x-9)$

$$\begin{aligned} 2(2x^2 - 9x - 22x + 99) &= \\ 4x^2 - 62x + 198 & \end{aligned}$$

k.  $(x+7)^2 = (x+7)(x+7) =$

$$x^2 + 14x + 49$$

l.  $(6s-2)^2 = (6s-2)(6s-2)$

$$36s^2 - 12s - 12s + 4 = 36s^2 - 24s + 4$$

m.  $(\frac{2}{3}a - b^2)(\frac{2}{3}a + b^2)$

$$\frac{4}{9}a^2 - b^4$$

n.  $5x^2(3x^2 - x + 2)$

$$15x^4 - 5x^3 + 10x^2$$

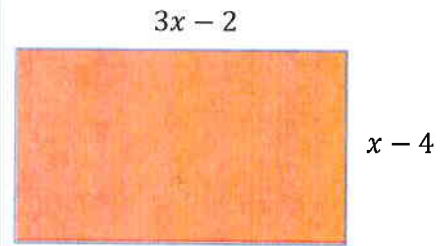
o.  $3(x-2)^2 = 3(x-2)(x-2)$

$$3(x^2 - 4x + 4) = 3x^2 - 12x + 12$$

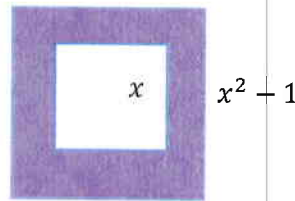
2. Find the area of the shaded region.

a. A rectangular canvas has a length of  $(3x - 2)$  inches and a width of  $(x - 4)$  inches.

$$\begin{aligned} (3x-2)(x-4) &= \\ 3x^2 - 12x - 2x + 8 &= \\ 3x^2 - 14x + 8 & \end{aligned}$$



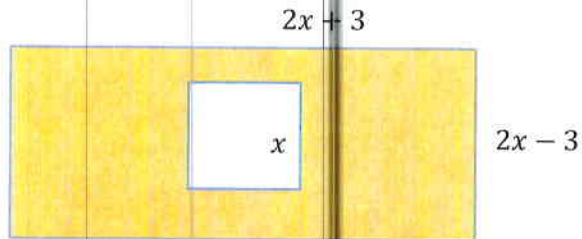
b.



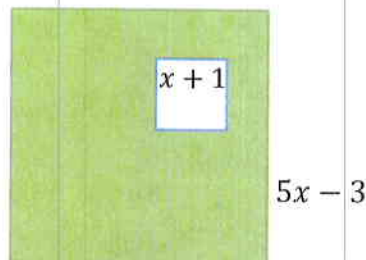
$$\begin{aligned} (x^2+1)^2 - x^2 &= \\ x^4 - 2x^2 + 1 - x^2 &= x^4 - 3x^2 + 1 \end{aligned}$$

c.

$$\begin{aligned} (2x+3)(2x-3) - x^2 &= \\ 4x^2 - 9 - x^2 &= \\ 3x^2 - 9 & \end{aligned}$$



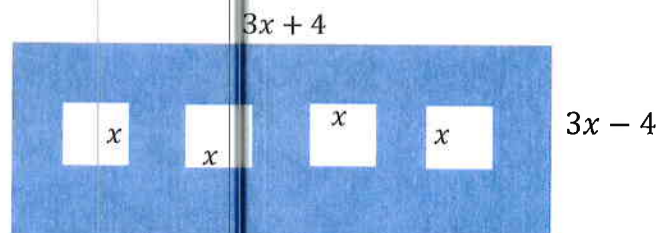
d.



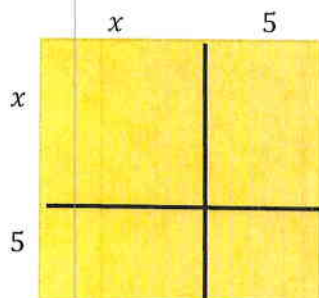
$$\begin{aligned} (5x-3)^2 - (x+1)^2 &= 25x^2 - 30x + 9 - (x^2 + 2x + 1) \\ &= 25x^2 - 30x + 9 - x^2 - 2x - 1 = 24x^2 - 32x + 8 \end{aligned}$$

e.

$$\begin{aligned} (3x+4)(3x-4) - 4x^2 &= \\ 9x^2 - 16 - 4x^2 &= 5x^2 - 16 \end{aligned}$$

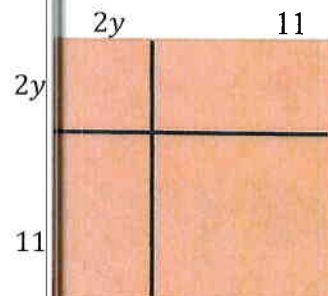


f.



$$\begin{aligned} (x+5)^2 &= x^2 + 5x + 5x + 25 \\ &= x^2 + 10x + 25 \end{aligned}$$

g.



$$(2y+11)^2 = 4y^2 + 44y + 121$$