

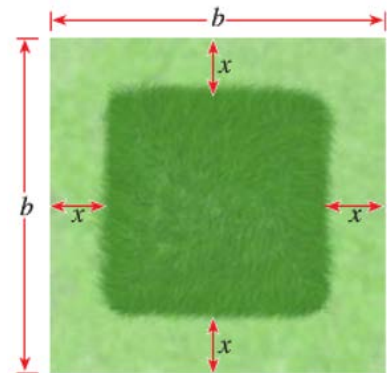
1. Factor.

- a) $x^{-3/2} + 2x^{-1/2} + x^{1/2}$
- b) $(x - 1)^{7/2} - (x - 1)^{3/2}$
- c) $x^{-1/2}(x^2 + 1)^{1/2} + x^{1/2}(x^2 + 1)^{-1/2}$

2. Factor.

- a) $8x^2 - 53x - 21$
- b) $7x^2 + 10x - 8$
- c) $4x^2 - 20x + 25$
- d) $9x^2 + 24x + 16$
- e) $x^4 - 4x^2$
- f) $x^3 - 25x$
- g) $64x^3 + y^6$
- h) $x^6 - 27y^3$
- b) $3x^3 + 3x^2 - 27x - 27$
- j) $5x^3 + 10x^2 - 20x - 40$

3. **Mowing a Field** A square field in a certain state park is mowed around the edges every week. The rest of the field is kept unmowed to serve as a habitat for birds and small animals (see the figure). The field measures b feet by b feet, and the mowed strip is x feet wide.



- (a) Explain why the area of the mowed portion is $b^2 - (b - 2x)^2$.
- (b) Factor the expression in part (a) to show that the area of the mowed portion is also $4x(b - x)$.

4. Factor.

- a) $a^4 - 2a^2 - 48$
- b) $6(4z - 3)^2 + 7(4z - 3) - 3$
- c) $4(5x + 7)^2 + 12(5x + 7) + 9$

5. Simplify.

- a) $3 + \frac{5}{u} + \frac{2u}{3u+1}$
- b) $\frac{2x}{x+2} - \frac{8}{x^2+2x} + \frac{3}{x}$

6. Simplify.

a) $\frac{y^{-1}+x^{-1}}{(xy)^{-1}}$

b) $\frac{y^{-2}-x^{-2}}{y^{-2}+x^{-2}}$

c) $\frac{\frac{r}{s} + \frac{s}{r}}{\frac{r^2}{s^2} - \frac{s^2}{r^2}}$

d) $\frac{\frac{3}{w} - \frac{6}{2w+1}}{\frac{5}{w} + \frac{8}{2w+1}}$

7. **Electrical Resistance** If two electrical resistors with resistances R_1 and R_2 are connected in parallel (see the figure), then the total resistance R is given by

$$R = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}}$$

(a) Simplify the expression for R .

(b) If $R_1 = 10$ ohms and $R_2 = 20$ ohms, what is the total resistance R ?

