

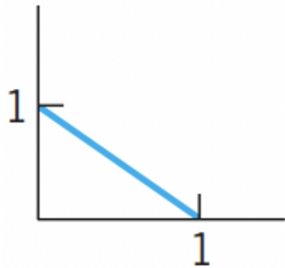
Exercise 1. Find the transform.

a.  $3t + 12$

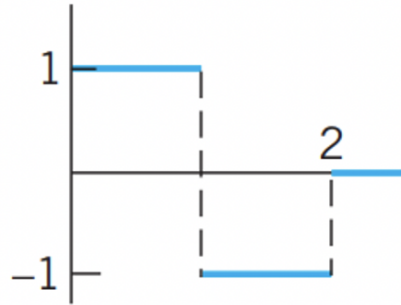
b.  $\cos(\pi t)$

c.  $e^{2t} \sinh(t)$

d.  $\sin(\omega t + \theta)$ , with  $\omega$  and  $\theta$  constants.



e.



f.

Exercise 2. (Optional) Give simple examples of functions (defined for all  $t \geq 0$ ) that have no Laplace transform.

Exercise 3. Given  $F(s) = \mathcal{L}(f)$ , find the inverse transform  $f(t)$ .

a.  $\frac{0.2s+1.8}{s^2+3.24}$

b.  $\frac{12}{s^4} - \frac{228}{s^6}$

c.  $\frac{s+10}{s^2-s-2}$

Exercise 4. Find the transform. Hint: use the s-Shifting theorem.

a.  $t^2 e^{-3t}$

b.  $0.5 e^{-4.5t} \sin 2\pi t$

Exercise 5. Find the inverse transform. Hint: use the s-Shifting theorem.

a.  $\frac{21}{(s+\sqrt{2})^4}$

b.  $\frac{\pi}{s^2+10\pi s+24\pi^2}$