

**Problem 23 in Section 7.1.** Find the inverse Laplace transform of  $F(s) = \frac{3}{s^4}$ .

**Solution.** The fact sheet shows that  $\mathcal{L}(t^n) = \frac{n!}{s^{n+1}}$ . When  $n = 3$ , this says that  $\mathcal{L}(t^3) = \frac{3!}{s^4}$ . Thus

$$\mathcal{L}^{-1}\left(\frac{3}{s^4}\right) = \frac{1}{2}\mathcal{L}^{-1}\left(\frac{3}{2}2s^4\right) = \boxed{\frac{1}{2}t^3}.$$