

Laplace Transforms

Find the Laplace transform of each of the following.

$$1. f(t) = 78e^{-9t} - 13t^3 - 5t^{\frac{13}{2}}$$

$$2. h(t) = 4 \sin(6t) - \sinh(6t)$$

$$3. g(t) = \cos\left(\frac{t}{4}\right) + 8e^{7t} \cos(3t)$$

$$4. h(t) = 10 \sin(9 - 2t) - t \cos(4t)$$

Inverse Laplace Transforms

Find the inverse Laplace transforms of each of the following.

$$5. G(s) = \frac{7 - 3s}{2s^2 + 9s + 3}$$

$$6. F(s) = \frac{6 + 7s^2}{(s - 6)(s + 2)(4s + 1)}$$

$$7. G(s) = \frac{2s + 3}{s^2(s - 2)^2}$$

$$8. H(s) = \frac{s^2}{(s - 7)(s^2 - 3s + 6)}$$

$$9. F(s) = \frac{4s - 5}{s(s^2 + 9)^2}$$