Piecewise Continuous Functions- HW Problems

In problems 1-4 find the inverse Laplace transform of the given function.

1. $F(s) = s^{-4}e^{-s}$
2. $F(s) = \frac{e^{-3s}}{s-3}$
3. $F(s) = \frac{e^{-2s}}{s^2+4}$
4. $F(s) = \frac{se^{-s}}{s^2+9}$

In problems 5-7 find the Laplace transform of the given function.

5. $f(t) = 3 \qquad 0 \le t \le 4$
   $= 0 \qquad t > 4$

6. $f(t) = t \qquad 0 \le t < 2$
   $= 0 \qquad t \ge 2$

7. $f(t) = \sin(2t) \qquad 0 \le t \le 2\pi$
   $= 0 \qquad t > 2\pi.$

In problems 8-10 solve the initial value problem.

8. $x'' + 9x = f(t)$, where

$f(t) = 1 \qquad 0 \le t < 2$

$= 0, \qquad t \ge 2$

and $x(0) = x'(0) = 0.$

9. $x'' + 4x = f(t)$, where

$f(t) = \sin(t) \qquad 0 \le t \le 2\pi$

$= 0 \qquad\qquad t > 2\pi$

and $x(0) = x'(0) = 0.$

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