# Assignment Math45-Homework-WEEK-13 due 12/01/2020 at 11:59pm PST

### **1.** (1 point)

Use linearity and known computations for the Laplace transform to compute  $\mathcal{L}\left\{\frac{\sin(2t)}{7} - 5\right\}$ .

• A. 
$$\mathcal{L}\left\{\frac{\sin(2t)}{7} - 5\right\} = \frac{2}{s^2 + 4} - 5$$

• B. 
$$\mathcal{L}\left\{\frac{\sin(2t)}{7} - 5\right\} = \frac{2}{7(s^2 + 2)} - \frac{5}{s}$$

• C. 
$$\mathcal{L}\left\{\frac{\sin(2t)}{7} - 5\right\} = \frac{2}{7(s^2 + 4)} - \frac{5}{s}$$

• D. 
$$\mathcal{L}\left\{\frac{\sin(2t)}{7} - 5\right\} = \frac{s}{7(s^2 + 4)} - \frac{5}{s}$$

#### **Solution:**

SOLUTION:

The correct answer is  $\frac{2}{7(s^2+4)} - \frac{5}{s}$ .

Correct Answers:

• C

### **2.** (1 point)

Use linearity and known computations for the Laplace transform to compute  $\mathcal{L}\left\{2e^{4t} + 6\cos(3t)\right\}$ .

• A. 
$$\mathcal{L}\left\{2e^{4t} + 6\cos(3t)\right\} = \frac{2}{s-4} + \frac{6s}{s^2+9}$$

• B. 
$$\mathcal{L}\left\{2e^{4t} + 6\cos(3t)\right\} = \frac{2}{s-4} + \frac{3}{s^2+9}$$

• C. 
$$\mathcal{L}\left\{2e^{4t} + 6\cos(3t)\right\} = \frac{4}{s^2 - 16} + \frac{6s}{s^2 + 9}$$

• D. 
$$\mathcal{L}\left\{2e^{4t} + 6\cos(3t)\right\} = \frac{4}{s-4} + \frac{6s}{s^2+3}$$

#### **Solution:**

SOLUTION:

The correct answer is  $\frac{2}{s-4} + \frac{6s}{s^2+9}$ .

Correct Answers:

P

**3.** (1 point)

Use linearity and known computations for the inverse Laplace transform to compute  $\mathcal{L}\left\{\frac{5s-7}{s^2+2}\right\}$ .

• A. 
$$\mathcal{L}^{-1}\left\{\frac{5s-7}{s^2+2}\right\} = 5\sin\left(\sqrt{2}t\right) - \frac{7}{\sqrt{2}}\cos\left(\sqrt{2}t\right)$$

• B. 
$$\mathcal{L}^{-1}\left\{\frac{5s-7}{s^2+2}\right\} = 5\cos\left(\sqrt{2}t\right) - 7\sin\left(\sqrt{2}t\right)$$

• C. 
$$\mathcal{L}^{-1}\left\{\frac{5s-7}{s^2+2}\right\} = 5\cos\left(\sqrt{2}t\right) - \frac{7}{\sqrt{2}}\sin\left(\sqrt{2}t\right)$$

• D. 
$$\mathcal{L}^{-1}\left\{\frac{5s-7}{s^2+2}\right\} = \frac{7}{2}\cos\left(\sqrt{2}t\right) - 5\sin\left(\sqrt{2}t\right)$$

## **Solution:**

SOLUTION:

The correct answer is  $5\cos\left(\sqrt{2}t\right) - \frac{7}{\sqrt{2}}\sin\left(\sqrt{2}t\right)$ .

Correct Answers:

• ℂ

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