以下共5題，每題 20分，合計 100分。

1. Please list two partial differential equations from the following equations:

   (A)　　　　　　　　　　　　　(B)

   $$\frac{\partial u}{\partial y}(x, 0) = \frac{\sin nx}{n},\qquad Lu = \sum_{\nu=1}^{n} A_\nu \frac{\partial u}{\partial x_\nu} - B = 0,$$

   (C)　　　　　　　　　　　　　(D)

   $$y(x) = \frac{y_0}{(x_0 - x)y_0 + 1}\qquad m\frac{\mathrm{d}^2 x(t)}{\mathrm{d}t^2} = F(x(t))$$

2. $x^2 + (x + y - 15)\,i = 0$, solve for $x = ?$ and $y = ?$

   (Hint: $x^2 = 0$ and $x + y - 15 = 0$)

3. For the Laplace's equation $L\{y\} = \frac{2s + 1}{s^2 + s - 6}$

   Solve $y(t) = ?$ (Hint: $s^2 + s - 6 = (s + 3)(s - 2)$)

4. Vector $\mathbf{A} = 3i - 2j + k$, $\mathbf{B} = i + 5j - 4k$

   Please evaluate $\mathbf{A} \cdot \mathbf{B}$ and $\mathbf{A} \times \mathbf{B}$

5. Which trigonometric functions have the value of 1? (Choose two answers)

   (A) $\sin(\pi/4)$　　　(B) $\cos(\pi/4)$　　　(C) $\tan(\pi/4)$　　　(D) $\cot(\pi/4)$