Readiness Assurance Test

Choose the most appropriate response for each question.

1) Which of the following is a root of $2x^2 - 6x + 5$?

(a) $3 - \frac{1}{2}i$ (b) $-3 + \frac{1}{2}i$ (c) $\frac{3}{2} - \frac{1}{2}i$ (d) $-\frac{3}{2} + \frac{1}{2}i$

2) Which of the following is equal to $e^{\frac{4\pi}{3}}$?

(a) $-\frac{1}{2} - \frac{\sqrt{3}}{2}i$ (b) $-\frac{1}{2} + \frac{\sqrt{3}}{2}i$ (c) $-\frac{\sqrt{3}}{2} - \frac{1}{2}i$ (d) $-\frac{\sqrt{3}}{2} + \frac{1}{2}i$

3) Which of the following is equal to $e^{\pi(2-3i)}$?

(a) $e^{2\pi}$ (b) $-e^{2\pi}$ (c) $e^{3\pi}$ (d) $-e^{3\pi}$

4) Which of the following is equal to $e^{it} - e^{-it}$?

(a) 0 (b) -1 (c) $2\cos(t)$ (d) $2i\sin(t)$

5) Which of the following differential equations models the position of an object falling in a vacuum?

(a) $x'' = -mg$ (b) $x' = -mg$ (c) $x'' = -g$ (d) $x'' = -g$

6) Compute $\int_0^{\frac{\pi}{2}} \sin(2t)\, dt$

(a) 0 (b) 1 (c) 2 (d) 4

7) Compute $\int_0^1 te^t \, dt$

(a) 1 (b) e (c) $e-1$ (d) $2e-1$

8) Compute $\int_0^1 te^{2t^2-1} \, dt$

(a) $\frac{e-e^{-1}}{4}$ (b) $\frac{e-1}{4}$ (c) $\frac{e+1}{4}$ (d) $\frac{e}{4}$

9) Compute $\int_4^8 \frac{1}{2-t} \, dt$

(a) $-\ln 3$ (b) $-\ln 2$ (c) $\ln 2$ (d) $\ln 3$

10) Find the solution of the system

$$x + 3y = 7$$
$$4x - y = 21$$

(a) $(5,-1)$ (b) $(-5,2)$ (c) $(-1,2)$ (d) $(-1,4)$