Problem # 1 answer (2 pts):
\[
\frac{\sin^{-1}\left(\sqrt{\frac{2}{3}}(x+1)\right)}{\sqrt{2}} + C
\]

not necessary

Problem # 2 answer (2 pts):
\[
\frac{1}{(x+1)^2}
\]

Problem # 3 answer (2 pts):
\[
y_8 = C + e^{-x}
\]

any letter for C

Problem # 4 answer:
(a) (2 pts)
\[
\frac{dy}{dx} = \frac{0.05}{1000} - \frac{3y}{1000 - 2t}
\]

(b) (2 pt)
\[
y = \frac{(0.05)}{1000} (1000 - 2t) - \frac{0.14 (1000 - 2t)^{3/2}}{1000^{3/2}}
\]

Problem # 5 answer (2 pts):
\[
\frac{4}{15}
\]

Problem # 6 answer (1 pts):
\[
8
\]
Problem # 7 answer (2 pt):

\[ \frac{\pi}{16} \]

Problem # 8 answer (1 pts):

\[ \left( \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right) = \left( \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}} \right) \]

Problem # 9 answer (2 pt):

\[ \sqrt{2} - \frac{1}{12} \]

Problem # 10 answer (2 pts):

\[ (\theta, r) = \left( \frac{\pi}{4}, \frac{\pi^2}{16} \right) \]

Problem # 11 answer:

(a) (2 pts) \[ \sum_{n=0}^{\infty} \frac{x^{2n+1}}{(2n+1)!} \text{ or } x + \frac{x^3}{3!} + \frac{x^5}{5!} + \cdots \]

(b) (1 pt) all \( x \)

(c) (1 pt) \[ 1.1667 \]

(d) (2 pts) \[ 0.085 \text{ or } 0.086 \]
\[ \text{or } 0.087 \text{ but not } 0.083 \text{ or } 0.084 \]
Problem # 12 answer:

(a) (1 pt)  

1.016

(b) (2 pts)

1.006

Problem # 13 answer:

(a) (2 pts)

0

(b) (2 pts)

\((x-1)^3\)

Problem # 14 answer (2 pts):

\(x^{2/2}\)

Problem # 15 answer:

(a) (2 pts)

\[2 + \frac{(x-8)}{12} - \frac{(x-8)^2}{3^2 25}\]

(b) (1 pt)

2.153

(c) (2 pts)

0.004