ANSWERS TO PRACTICE TEST FOR CHAPTER ONE

1 = E
2 = C
3 = C
4 = A
5 = D
6 = A
7 = B
8 = D
9 = B
10=E
11=D
12=D [6x]

FR1
You should have a vertical asymptote at x = -3; a point at (3, -2); a removable discontinuity at (3, 4)

FR2

$$\begin{aligned} h(1) &= g(f(1))+2 \\ &= g(3)+2 \\ &= -10+3 \\ &= -8 \end{aligned}$$

$$\begin{aligned} h(5) &= g(f(5))+2 \\ &= g(7)+2 \\ &= 25+2 \end{aligned}$$

By the IVT, here is a c, $1 < c < 5$, such that $h(1) < h(c) < h(5)$. So there is a c, $1 < c < 5$, such that $-8 < h(c) < 27$. Hence, there must exist an $h(c) = 0$ for the interval $1 < c < 5$

13 = C
14 = A
15 = E
16 = B
17 = C
18 = A
19 = C
20 = C

FR3

$$f(x) = \begin{cases} \dfrac{4\sin x}{x}, & x < 0 \\ a + 15x, & x \geq 0 \end{cases}$$

We need $\lim_{x \to 0} f(x) = f(0)$

$\lim_{x\to 0^-} f(x) = 4$

$\lim_{x\to 0^+} f(x) = a$

$f(0) = a$

Hence, $a = 4$.

BONUS

$f(3) = 2$

$\lim_{x\to 3^-} f(x) = 2$

$\lim_{x\to 3^+} f(x) = 2$

$\lim_{x\to 3} f(x) = 2$

Since $f(3) = \lim_{x\to 3} f(x)$, then f is continuous at $x = 3$.

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