PRACTICE FINAL MULTIPLE CHOICE – ANSWER KEY

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1 C (calculate $F(x)$ by antidifferentiating, and then calculate $F(1)$)

2 D (you can add *any* constant to F and still get an antiderivative)

3 B (because f is decreasing on $[-6, -4]$ and increasing on $[2, 4]$)

4 C (the two functions are both positive)

5 A

6 C

7 C (it equals to $\frac{1}{2}\ln|x+1| + C = \ln\left((x+1)^{\frac{1}{2}}\right) + C$

8 A (use $u = e^x$, you should get $e^e - e$)

9 D

10 B

11 A

12 A (use $u' = x$, $v = \ln(x)$)

13 C

14 A

15 B

16 B (integral test)

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17 E (use the ratio test to get at least the interval $(-1, 1)$. Moreover it diverges for $x = 1$ because it becomes (one half) the harmonic series, and it converges for $x = -1$ by the alternating series test, hence we get $[-1, 1)$)

18 B (use the ratio test to get at least the interval $(-7, 7)$. It diverges for $x = 7$ because we get the series $\sum_{k=0}^{\infty} k$ (the terms don't converge to 0) and it diverges for $x = -7$ because we get the series $\sum_{k=0}^{\infty} (-1)^k k$ (the terms don't converge to 0 either))

19 B (write the function as $\frac{1}{1+\frac{x}{2}} = \frac{1}{1-\left(\frac{-x}{2}\right)}$)

20 C (start with the Maclaurin series of e^x and plug in $x = -1$)