

18. {1.ii, 1.iv, 1.vi, 1.x, 5.ii, 5.iv, 5.vi, 8.b, 8.d, 8.f}, 20. {1.ii, 1.iv, 1.vi, 2.ii, 2.iv}

**18.1.ii**

Differentiate

$$f(x) = \log \left( 1 + \log \left( 1 + \log \left( 1 + e^{1+e^{1+x}} \right) \right) \right).$$

■

**18.1.iv**

Differentiate

$$f(x) = e^{\left( \int_0^x e^{-t^2} dt \right)}.$$

■

**18.1.vi**

Differentiate

$$f(x) = \log_{e^x} \sin x.$$

■

**18.1.x**

Differentiate

$$f(x) = x^x.$$

■

**18.5.ii**

Find the following limit by l'Hopital's Rule.

$$\lim_{x \rightarrow 0} \frac{e^x - 1 - x - x^2/2 - x^3/6}{x^3}.$$

■

**18.5.iv**

Find the following limit by l'Hopital's Rule.

$$\lim_{x \rightarrow 0} \frac{\log(1+x) - x + x^2/2}{x^2}.$$

■

**18.5.vi**

Find the following limit by l'Hopital's Rule.

$$\lim_{x \rightarrow 0} \frac{\log(1+x) - x + x^2/2 - x^3/3}{x^3}.$$

■

**18.8.b**

Prove that

$$\tanh^2 + \frac{1}{\cosh^2} = 1.$$

■

**18.8.d**

Prove that

$$\cosh(x+y) = \cosh x \cosh y + \sinh x \sinh y.$$

■

**18.8.f**

Prove that

$$\cosh' = \sinh.$$

■

**20.1.ii**

Find the Taylor polynomials (of the indicated degree, at the indicated point) for

$$f(x) = e^{e^x}; \text{ degree 3, at 0.}$$

■

**20.1.iv**

Find the Taylor polynomials (of the indicated degree, at the indicated point) for

$$\cos ; \text{ degree } 2n, \text{ at } \pi.$$

■

**20.1.vi**

Find the Taylor polynomials (of the indicated degree, at the indicated point) for

$$\log ; \text{ degree } n, \text{ at } 2.$$

■

**20.2.ii**

Write the following polynomial in  $x$  as a polynomial in  $(x - 3)$ :

$$x^4 - 12x^3 + 44x^2 + 2x + 1.$$

■

**20.2.iv**

Write the following polynomial in  $x$  as a polynomial in  $(x - 3)$ :

$$ax^2 + bx + c.$$

■