9 Repetition

9.1 The answers are:

$$8, \qquad -5, \qquad \frac{11}{15}, \qquad \frac{5}{3}.$$

9.2 The answers are:

$$-1, \qquad 45, \qquad \frac{17}{30}, \qquad 5.$$

9.3 The answers are:

$$\frac{3-\sqrt{2}}{2}, \qquad 3, \qquad 3.$$

9.4 The answers are:

$$x^2+25+10x, \qquad 4x^2+1-4x, \qquad 4y^2-1, \qquad 2y^2-x^2.$$

9.5 The answers are:

$$\frac{x-y}{x}, \qquad \frac{x+y}{x}, \qquad y.$$

9.6 The answers are:

$$x=-2, \qquad x=\frac{63}{10}, \qquad x=-1, x=3.$$

9.7 The answers are:

$$x=\pm\sqrt{2}, \qquad x=1, x=-\frac{1}{2}.$$

9.8 The answers could be:

$$x=\frac{1}{2}, \qquad x=\frac{4\pi}{3}, \qquad x=4.$$

9.9 The answers are:

$$a=0, \qquad a\in\mathbb{R}\setminus\{-1\},$$
$$a\in\mathbb{R}\setminus\{-1\}, \qquad \text{Never true.}$$

9.10 The answers are:

$$f'(x) = 6x^2 - 2x, \qquad g'(x) = -4x^{-3} + 1, \qquad h'(x) = -\frac{2}{x^2} + 1.$$

9.11 The answers are:

$$\frac{2}{3}x^3 + x + k, \qquad\qquad -\frac{1}{6}, \qquad\qquad 12.$$

9.12 The answers are:

$$\begin{aligned} f'(x) &= 6x^2 + 2x^{-3} - 4x^{-2}, \\ g'(x) &= 3e^3 - \frac{1}{2\sqrt{x-1}}, \\ h'(x) &= (x+1)2e^x - (2x-1)\cos(x^2 - x). \end{aligned}$$

9.13 The answers are:

$$-2e^{-x} + k, \qquad\qquad 2e - 2, \qquad\qquad 6 - 2\sqrt{5}.$$