

#1.

$$(2^{\sqrt{3}} \times 4)^{\sqrt{3}-2} = 2^{(\sqrt{3}+2)(\sqrt{3}-2)} = \frac{1}{2} \quad (2)$$

#2.

$$f'(1) = 3+6+1 = 10$$

#3.

$$\begin{array}{cccc} a_4 & a_5 & a_8 & a_{11} \\ || & || & || & || \\ 6 & 18 & 30 & 42 \end{array}$$

$$a_{10} = 30 + 12 \times \frac{2}{3} = 38$$

\therefore (5)

#4.

$$3+1 = 4$$

#5.

$$1+2+4+8+1+2+4+8 = 30$$

#6.

$$f(x) = -2x^3 + 3x^2 + 12x$$

$$f'(x) = -6x^2 + 6x + 12 = -6(x^2 - x - 2) = -6(x-2)(x+1)$$

$$f(-1) = 2+3-12 = -7 \quad f(2) = -16+12+24 = 20$$

$$-7 < k < 20 \quad (3)$$

#7.

$$t - \frac{6}{t} = 1$$

$$t^2 - t - 6 = 0 \quad (t-3)(t+2) = 0$$

$$t = \tan \theta > 0$$

$$\tan \theta = 3 = \frac{\sin \theta < 0}{\cos \theta < 0}$$

$$\therefore \sin \theta + \cos \theta = -\frac{4}{\sqrt{10}} = -\frac{2\sqrt{10}}{5}$$

