Quadratic Finding

The equation of the general quadratic curve is given by

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

The equation of the general cubic curve is given by

$$y = ax^3 + bx^2 + cx + d.$$

If a curve[1] passes through a given point, then that point represents a *solution* to the equation of the curve.

1. Find the equation of the quadratic curve that passes through $(3, 15)$, $(1, -1)$ and $(0, -3)$.

   $\boxed{y = 2x^2 - 3}$

2. Find the equation of the quadratic curve that passes through $(1, 3)$, $(3, 9)$ and $(-2, 9)$.

   $\boxed{y = x^2 - x + 3}$

3. Find the equation of the quadratic curve that passes through $(1, 0)$, $(5, 40)$ and $(-2, -9)$.

   $\boxed{y = x^2 + 4x - 5}$

4. Find the equation of the quadratic curve that passes through $(7, -4)$, $(-4, -37)$ and $(2, 11)$.

   $\boxed{y = -x^2 + 6x + 3}$

5. Find the equation of the quadratic curve that passes through $(-2, 21)$, $(\frac{1}{2}, 1)$ and $(\frac{2}{3}, \frac{13}{9})$.

   $\boxed{y = 4x^2 - 2x + 1}$

6. Find the equation of the quadratic curve that passes through $(1, \frac{5}{2})$, $(3, \frac{19}{2})$ and $(-1, \frac{7}{2})$.

   $\boxed{y = x^2 - \frac{1}{2}x + 2}$

7. Find the equation of the quadratic curve that passes through $(\frac{1}{2}, \frac{5}{8})$, $(2, 1)$ and $(-1, \frac{5}{2})$.

   $\boxed{y = \frac{1}{2}x^2 - x + 1}$

8. Find the equation of the *cubic* curve that passes through $(0, 1)$, $(1, 4)$, $(-2, 1)$ and $(3, 46)$.

   $\boxed{y = x^3 + 2x^2 + 1}$

9. Find the equation of the *cubic* curve that passes through $(1, 1)$, $(3, 29)$, $(-1, -3)$ and $(-2, -11)$.

   $\boxed{y = x^3 + x - 1}$

[1] Or, for that matter, straight line