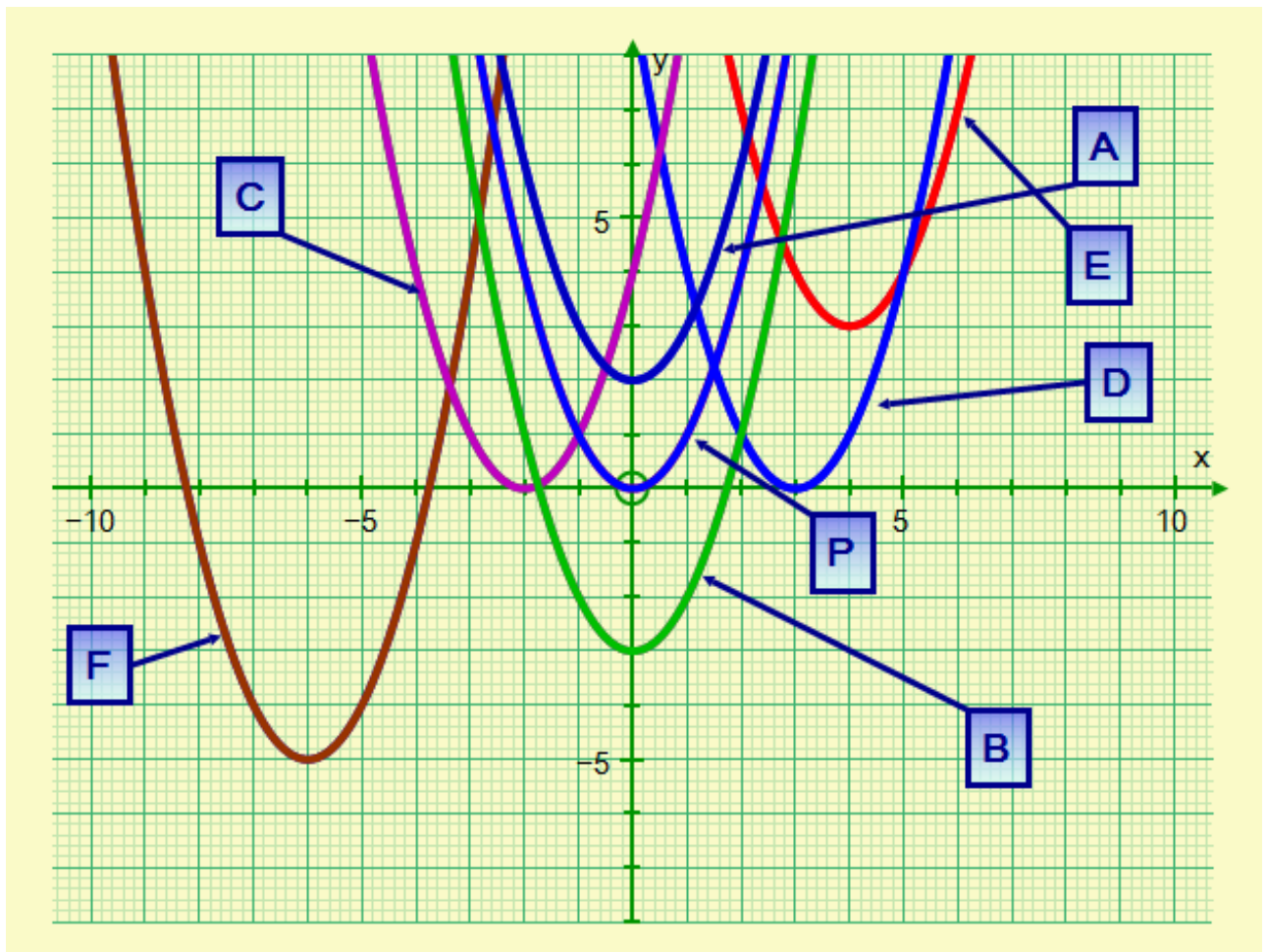


Worksheet on Transformations of Graphs (Years 10-11 Higher, Revision for Year 12)

1.

(i) Describe the transformation that maps graph P to each of the following:

- (a) A (b) B (c) C (d) D (e) E (f) F



(ii) Given that P is the graph of $y = f(x)$, express each of the graph A, B, C, D, E and F in terms of $f(x)$.

(iii) Given that P is the graph of $y = x^2$, write down the equation of each of the graphs A, B, C, D, E and F.

Challenging:

2. Given that $y = f(x) = x^2 + 2x + 1$, write down the equation of $y = f(x + 1)$ and simplify your answer where necessary, writing it in the form $y = (x + a)^2$, where a is an integer to be found.

Answers:

1. (i) Each is a translation of graph P, vector :

(a) $\begin{pmatrix} 0 \\ 2 \end{pmatrix}$ (b) $\begin{pmatrix} 0 \\ -3 \end{pmatrix}$ (c) $\begin{pmatrix} -2 \\ 0 \end{pmatrix}$ (d) $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$ (e) $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$ (f) $\begin{pmatrix} -6 \\ -5 \end{pmatrix}$

(ii) A: $y = f(x) + 2$ B: $y = f(x) - 3$ C: $y = f(x + 2)$ D: $y = f(x - 3)$

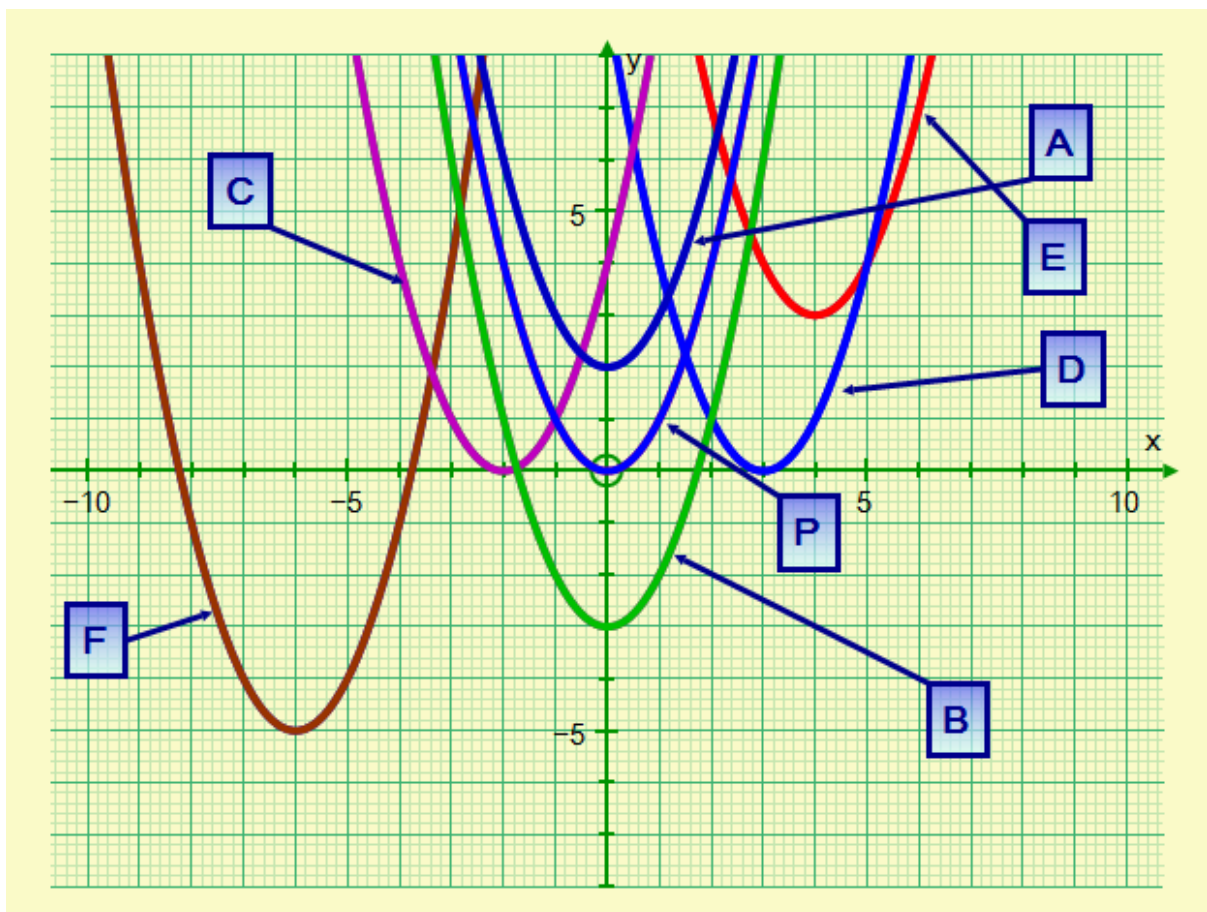
E: $y = f(x - 4) + 3$ F: $y = f(x + 6) - 5$

(iii) A: $y = x^2 + 2$ B: $y = x^2 - 3$ C: $y = (x+2)^2$ D: $y = (x-3)^2$

E: $y = (x-4)^2 + 3$ F: $y = (x+6)^2 - 5$

2. Method 1: $y = f(x + 1) = (x + 1)^2 + 2(x + 1) + 1 = x^2 + 2x + 1 + 2x + 2 + 1 = x^2 + 4x + 4 = (x + 2)^2$. $a = 2$.

Method 2: $y = f(x) = (x + 1)^2, y = f(x + 1) = (x + 1 + 1)^2 = (x + 2)^2, a = 2$.



I hope you find this useful. If you find any errors, please let me know.