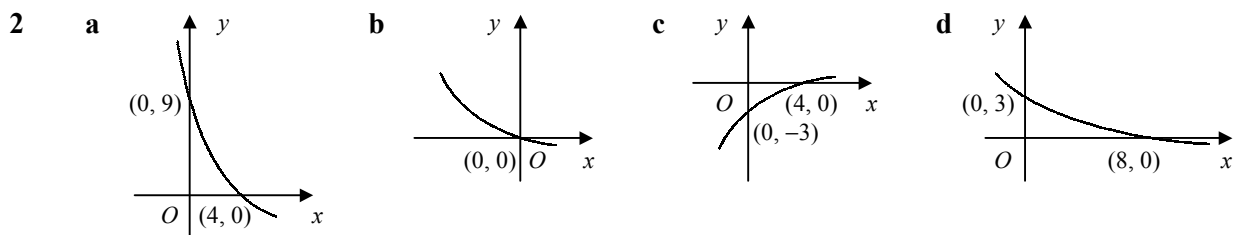
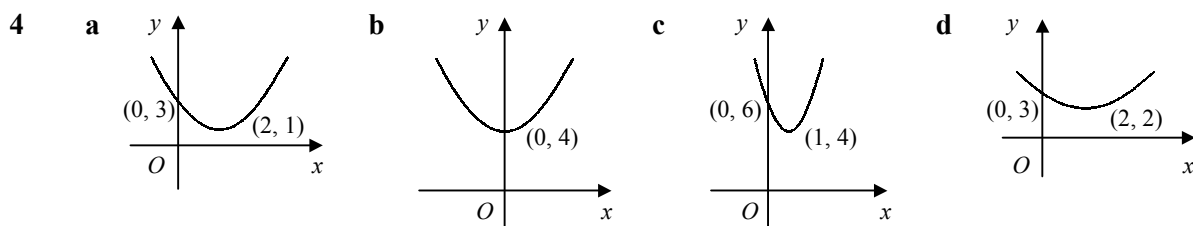


- 1 a translated 1 unit in positive x -direction
 c stretched by a factor of 2 in y -direction
 e reflected in the x -axis
 g reflected in the y -axis
- b translated 3 units in negative y -direction
 d stretched by a factor of $\frac{1}{4}$ in x -direction
 f stretched by a factor of $\frac{1}{5}$ in y -direction
 h stretched by a factor of $\frac{3}{2}$ in x -direction



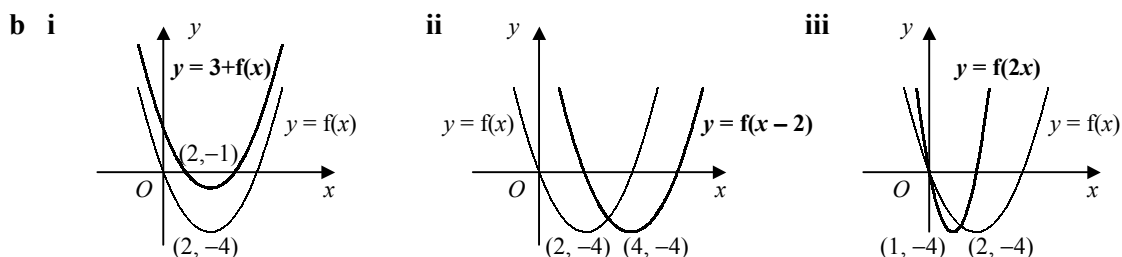
- 3 a $y = 2x + 5 + 1 \Rightarrow y = 2x + 6$
 c $y = 3(x + 4) + 1 \Rightarrow y = 3x + 13$
- b $y = 3(1 - 4x) \Rightarrow y = 3 - 12x$
 d $y = -(4x - 7) \Rightarrow y = 7 - 4x$



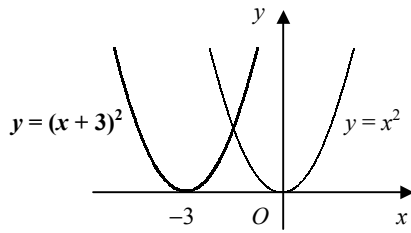
- 5 a stretch by a factor of 4 in y -direction
 c reflection in the x -axis
- b translation by 2 units in positive x -direction
 d translation by 5 units in positive y -direction
- 6 a $y = 2(x^2 + 2)$
 stretch by a factor of 2 in y -direction
- b $y = (x^2 + 2) - 7$
 translation by 7 units in negative y -direction
- c $y = (\frac{1}{3}x)^2 + 2$
 stretch by a factor of 3 in x -direction
- d $y = (x + 2)^2 + 2$
 translation by 2 units in negative x -direction

- 7 a $y = (x - 1)^2 + 2(x - 1) \Rightarrow y = x^2 - 1$
 b $y = (3x)^2 - 4(3x) + 5 \Rightarrow y = 9x^2 - 12x + 5$
 c $y = (-x)^2 + (-x) - 6 \Rightarrow y = x^2 - x - 6$
 d $y = 2(\frac{1}{2}x)^2 - 3(\frac{1}{2}x) \Rightarrow y = \frac{1}{2}x^2 - \frac{3}{2}x$

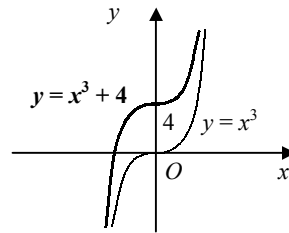
- 8 a $f(x) = (x - 2)^2 - 4 \therefore$ turning point $(2, -4)$



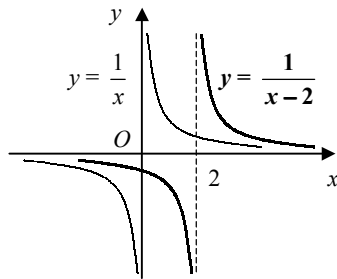
9 a



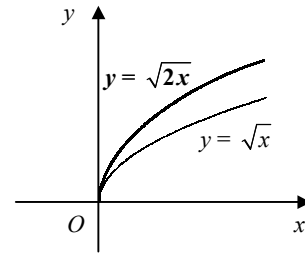
b



c

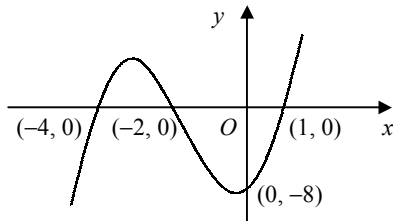


d

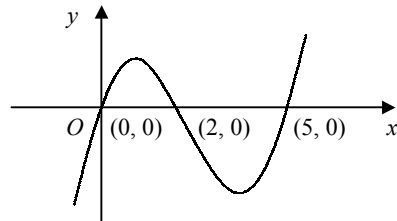


- 10 a let $f(x) = \frac{1}{x} \therefore \frac{1}{3x} = \frac{1}{3}f(x)$ or $f(3x)$
 \therefore stretch by a factor of $\frac{1}{3}$ in y -direction
 or stretch by a factor of $\frac{1}{3}$ in x -direction
- b let $g(x) = x^2 \therefore 4x^2 = 4g(x)$ or $g(2x)$
 \therefore stretch by a factor of 4 in y -direction
 or stretch by a factor of $\frac{1}{2}$ in x -direction

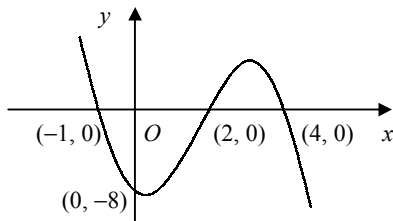
11 a



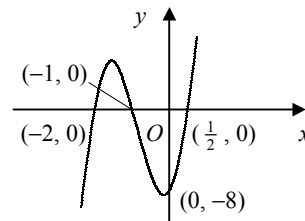
b



c

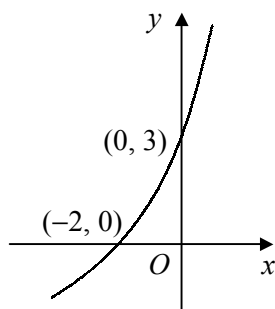


d



- 12 a $(a, 3b)$ b $(a, b + 4)$ c $(a - 1, b)$ d $(3a, b)$

13 a



b

