Samples **Functions and their graphs SOLUTIONS**

1. (**1**) $2y+5x^2 = 16y+10x^2+1$, so $14y = -5x^2-1$. This equation includes an x^2 term with a negative coefficient, so the graph is a parabola which turns downwards. Also, the y-intercept is negative. Hence the matching graph is Graph T.

(**2**) $y = e^{3x}$, which is a graph of exponential growth. Hence the matching graph is Graph K.

(**3**) $11y - 7 = 5x - 7$, so $11y = 5x$. Hence this is a straight line, with positive gradient and passing through the origin. Hence the matching graph is Graph F.

(**4**) $-15y + 9 = x^2 + 9$, so $15y = -x^2$. This equation includes an x^2 term with a negative coefficient, so the graph is a parabola which turns downwards. Also, the y-intercept is 0. Hence the matching graph is Graph S.

(**5**) $11x - 8 = -3y + 11x - 10$, so $3y = -2$, so $y = -\frac{2}{3}$. Hence this is a horizontal line, with y negative. Hence the matching graph is Graph D.

(**6**) $-7y + 8x - 4 = 9y + 7$, so $16y = 8x - 11$. Hence this is a straight line, with positive gradient and negative y-intercept. Hence the matching graph is Graph E.

(**7**) $1 = -13x$, so $x = -\frac{1}{13}$. Hence this is a vertical line, with x negative. Hence the matching graph is Graph A.

(**8**) $y = e^{-x}$, which is a graph of exponential decay. Hence the matching graph is Graph L.

2. (**1**) $-14y - 6x^2 + 7 = -15y - 9x^2 - 16$, so $y = -3x^2 - 23$. This equation includes an x^2 term with a negative coefficient, so the graph is a parabola which turns downwards. Also, the y-intercept is negative. Hence the matching graph is Graph T.

(**2**) $9x - 4 = 13x$, so $-4x = 4$, so $x = -1$. Hence this is a vertical line, with x negative. Hence the matching graph is Graph A.

(**3**) $y = e^{3x}$, which is a graph of exponential growth. Hence the matching graph is Graph K.

(**4**) $6y - 15 = -16$, so $6y = -1$, so $y = -\frac{1}{6}$. Hence this is a horizontal line, with y negative. Hence the matching graph is Graph D.

(**5**) $y = 8 \times |9x|$, which is a graph of absolute value. Hence the matching graph is Graph N.

(**6**) $12y - 5 = 14y - 15x + 13$, so $2y = 15x - 18$. Hence this is a straight line, with positive gradient and negative y-intercept. Hence the matching graph is Graph E.

(**7**) $14x + 5 = 15x - 1$, so $-x = -6$, so $x = 6$. Hence this is a vertical line, with x positive. Hence the matching graph is Graph B.

(**8**) $-x-5 = -10y-16x-14$, so $10y = -15x-9$. Hence this is a straight line, with negative gradient and negative y-intercept. Hence the matching graph is Graph J.

3. (**1**) $9y + 8x - 9 = 12y + 8x - 10$, so $-3y = -1$, so $y = \frac{1}{3}$. Hence this is a horizontal line, with y positive. Hence the matching graph is Graph C.

(**2**) $-9y + 5x - 2 = 16y + 8x - 9$, so $25y = -3x + 7$. Hence this is a straight line, with negative gradient and positive y-intercept. Hence the matching graph is Graph H.

(**3**) $y = 2 \times |-13x|$, so $y = 2 \times |13x|$, which is a graph of absolute value. Hence the matching graph is Graph N.

(**4**) $y = -5 \times |8x|$, which is a graph of negative absolute value. Hence the matching graph is Graph M.

(**5**) $4y + 6x - 14 = 6y - 5x - 14$, so $2y = 11x$. Hence this is a straight line, with positive gradient and passing through the origin. Hence the matching graph is Graph F.

(**6**) $-4y - 13 = -9y + 5x^2$, so $5y = 5x^2 + 13$. This equation includes an x^2 term with a positive coefficient, so the graph is a parabola which turns upwards. Also, the y-intercept is positive. Hence the matching graph is Graph O.

(**7**) $15x^2 = 5y$. This equation includes an x^2 term with a positive coefficient, so the graph is a parabola which turns upwards. Also, the y-intercept is 0. Hence the matching graph is Graph P.

(**8**) $7y = 15y + 6x^2 + 15$, so $8y = -6x^2 - 15$. This equation includes an x^2 term with a negative coefficient, so the graph is a parabola which turns downwards. Also, the y-intercept is negative. Hence the matching graph is Graph T.