1. (a) $y = e^{7x}$, which is a graph of exponential growth. Hence the matching graph is Graph K.

   (b) $-8y + 9x^2 = -16y + 15x^2$, so $8y = 6x^2$. 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.

   (c) $-13y + 9 = -3y - 15$, so $-10y = -24$, so $y = \frac{24}{10}$. Hence this is a horizontal line, with y positive. Hence the matching graph is Graph C.

   (d) $-8y + 12x = -6y + 14x$, so $2y = -2x$. Hence this is a straight line, with negative gradient and passing through the origin. Hence the matching graph is Graph I.

   (e) $3x - 13 = -7x + 3$, so $10x = 16$, so $x = \frac{16}{10}$. Hence this is a vertical line, with x positive. Hence the matching graph is Graph B.

   (f) $-3y + 9x^2 - 14 = 6x^2 - 15$, so $3y = 3x^2 + 1$. 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.

   (g) $-2y - 2x + 11 = 13y - 6x + 11$, so $15y = 4x$. Hence this is a straight line, with positive gradient and passing through the origin. Hence the matching graph is Graph F.

   (h) $y = e^{-3x}$, which is a graph of exponential decay. Hence the matching graph is Graph L.

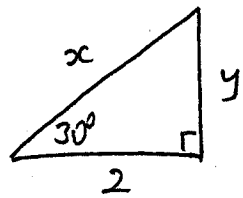
2. Given an angle a in degrees, to convert a to radians you divide by 180 and multiply by π. Hence the converted angles are:

$$\frac{11\pi}{10} \quad \frac{9\pi}{20} \quad \frac{\pi}{2} \quad -\frac{7\pi}{12} \quad \frac{5\pi}{2} \quad \frac{\pi}{15} \quad -\frac{16\pi}{9} \quad \frac{7\pi}{3}$$

3. Given an angle a in radians, to convert a to degrees you multiply by 180 and divide by π. Hence the converted angles are:

$$-198° \quad -300° \quad 300° \quad 126° \quad 30° \quad 720° \quad 1080° \quad 468°$$

4. A ladder is placed up against a wall at an angle of elevation of 30°. If the ladder is $2m$ away from the base of the wall, how long is it? How far up the wall does the ladder reach?



Let x be the length of the ladder. Then $\cos 30° = \frac{2}{x}$, so $x = \frac{2}{\cos 30°} \approx 2.31$m. Let y be the distance the ladder reaches up the wall. Then $\tan 30° = \frac{y}{2}$, so $y = 2\sin 30° \approx 1.15$m.

5. (a) The roots of $y = 4x^2 + 36x$ are the x values that satisfy $4x^2 + 36x = 0$. You can solve this equation either by using the quadratic formula or by factoring. Here we will use factoring.

First divide through by 4 to get $x^2 + 9x = 0$. Now because $x^2 + 9x = (x + 9)\,x$, the two roots of the quadratic equation are $x = -9,\ 0$.

(b) The y-intercept occurs when $x = 0$, so substituting this into $y = 4x^2 + 36x$ gives $y = 0$.

(c)