MTHS100 - Assignment 8

Question 1

a) x^1/4
b) x^-7
c) x^4/3

Question 2

a) x^6 = 64, Take the 6th root from both side to = ^6√x = +/- the ^6√64
x = -2, 2

b) x^-3 = 27, To get rid of the negative exponent in x we first want to flip the 27/1 to
x^3 = 1/27, now we take the 3rd root of 1/27 to get our answer
x = 1/3 as 3 * 3 * 3 = 27

c) √x = 1/3, First we get rid of the √ by squaring both sides, so x = (1/3)^2 which equals
x = 1/9

d) ^3√x^5 = 32, First we have to cube both sides to get
x^5 = 32^3
x^5 = 32,768, then we take the 5th root of both sides to get
x = ^5√32768
x = 8

e) x^-1/2 = 8, This is the same as question c.
x^1/2 = 1/8, Then square 1/8
x = 1/64

Question 3

a) 3rd degree polynomial
b) A constant which is also a power function considering that 1 can be 1^1
c) Linear
d) Rational
e) Power as it could be expressed as x^1/3

Question 4

a) $x - \sqrt{3} = 0$ & $3x - 8 = 0$

$x = \sqrt{3}$ $3x = 8$

$x = 8/3$

The x’s or zeros are at √3 and 8/3 and the function’s domain is all real numbers.

b) $x - 9 = 0$ & $x + 9 = 0$

$x = 9$ $x = -9$

x’s or the zeros are at 9, -9 and the function’s domain is all real numbers except 1 as that would make the denominator equal to 0 which does not make sense.

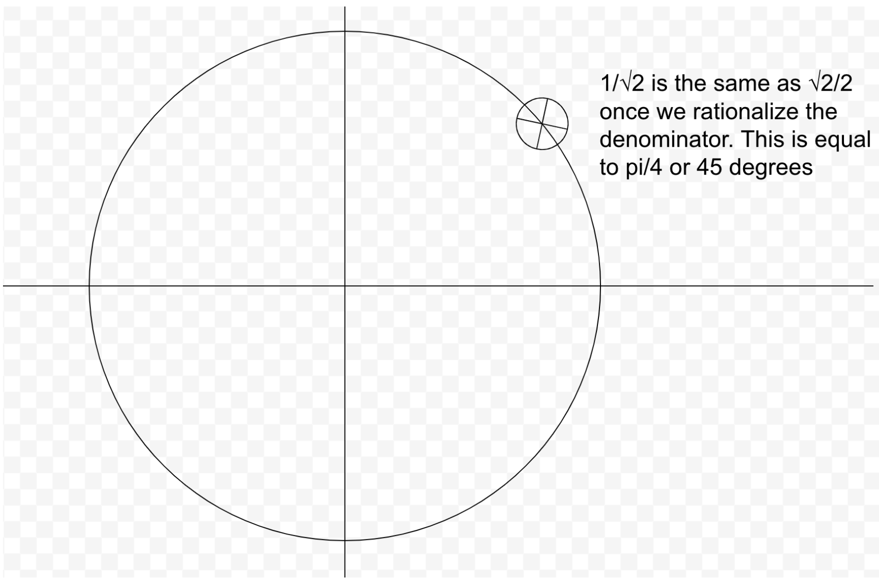
Question 5

A right angle with two equal sides and a hypotenuse of 1 can be written like so:

a^2 + a^2 = c^2, which can be written as:
2a^2 = c^2, Square root to remove the squares
√2a = c, now we get (a) alone
a = c/√2, and we know c = 1
a = 1/√2, this is the answer, but if we wanted to rationalize the denominator we simply times the fraction by root 2.
= 1√2/ √2 * √2
= √2 / 2

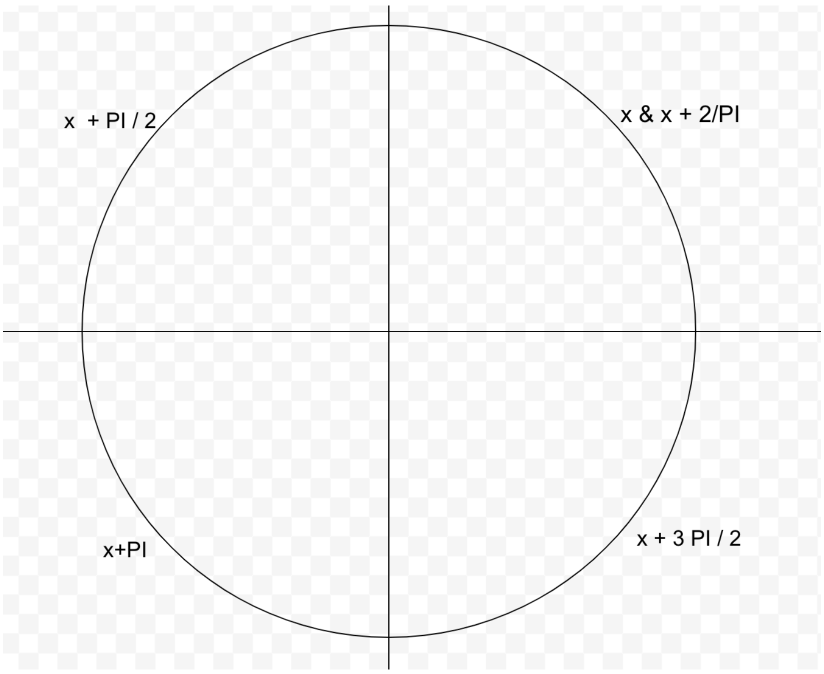
Question 6

a)



b) Given that the sine and cosine of x are both positive numbers, we can conclude that the angle x sits in the first quadrant of the unit circle (between 0 - 90 degrees). Next we can conclude that sine and cosine are of equal length, meaning we are working with a right angle triangle with two equal sides. Knowing that a triangle's angles must add up to 180, we can subtract 90 from the total leaving 90 degrees left to split equally between the other two angles, given the lengths of the sides are equal.
90 / 2 = 45 degrees
In Radians = 45 * pi / 180 = 0.785 pi radians

c)



d) PI = 180 degrees as PI/PI = 1 and then multiply it by 180 = 180, so with this in mind:
X + PI =
45 + 180 = 225 degrees

Radians:
225 * PI / 180 = 3.927, which makes sense as PI = 180 and PI = 3.14 and 3. 92 is greater than 3.14.

sin(x + PI) = sin(225) = - 0.707
cos(x + PI) = cos(225) = - 0707
tan(x + PI) = tan(225) = 1

Which also makes sense as $\tan = \sin(x) / \cos(x)$