TY Honours Maths - Worksheet No.10

1. Given that $\sqrt{4x^2+12x+9} = ax+b$,
find the values of the constants a and b.

2. Express $\frac{3}{\sqrt{20}} + \frac{8}{\sqrt{45}}$ in the form $\frac{k\sqrt{m}}{n}$
where k, m and $n \in \mathrm{N}$

3. Explain briefly what is meant by the factor theorem.

4. Find the value of k if the equation $k^2x^2 + 2(k+1)x + 4 = 0$ has equal roots.

5. Given that $x-1$ is a factor of $2x^3 + tx^2 + 4x + 2t$,
find the value of t.

6. Factorise fully
(i) $x^4 - x$

(ii) $3x^2 + 26x - 9$

7. Given that the quadratic equation $x^2 + 2tx - 2x + 2t + 1 = 0$ has equal roots,

(i) find the value of t where $t > 0$.

(ii) use this value of t to evalute the roots.

8. Write down a quadratic equation that has roots of 2 and -3 in the form of $ax^2 + bx + c = 0$ where $a, b, c \in Z$.

9. Solve the following equation: $x^2 + 6x - 2 = 0$ leaving your answers in surd form:

10. Fill in the following table

Quadratic	Discriminant	Nature of roots
$x^2 + 6x + 9$		
$2x^2 + 3x + 2$		
$3x^2 + 6x + 2$		