Likelihood function

returns the likelihood using the given parameters and the gradient of the likelihood wrt each of the parameters to be used by the minimise.m function

```
function [J grad] = ll(theta, X,y,n)

    Ky = exp_cov(X,X,theta)+(theta(3)^2)*eye(n);
```

Ky is the covariance matrix for the training data

```
     Kyi = inv(Ky);
    J = (1/2)*y'*Kyi*y+(1/2)*log(det(Ky))+(n/2)*log(2*pi);

    grad = zeros(3,1);
    alpha = Ky\y;
    al = alpha*alpha';
    A = al-Kyi;
    grad(1) =(1/2)*trace(A*(2/theta(1))*Ky);
```

gradient wrt sig1

```
    d = pdist2(X,X);
    d2 = d.^2;
    d2l = d2/(theta(2)^3);
    grad(2) =(1/2)*trace(A*Ky*d2l);
```

grad wrt lambda

```
    grad(3) =(1/2)*trace(A*(2/theta(3))*eye(n));
```

grad wrt sign

```
end
```

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