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```
function [p_k, rho] = rad_fit(f, m_k, x_k, delta)
```

RAD_FIT Introduction

Establishes the scalar for the trust region radius

f: The `function` being evaluated

m_k: The quadratic `function used for optimization`

delta: The current `trust radius`

SETTING UP FUNCTIONS

```
x          = sym('x', [2,1]);  
f_grad(x)  = gradient(f);  
f_hess(x)  = hessian(f);  
  
f_eval     = matlabFunction(f, 'Vars', {x});  
f_grad     = matlabFunction(f_grad, 'Vars', {x});  
f_hess     = matlabFunction(f_hess, 'Vars', {x});
```

ESTABLISHING TRUST REGION SCALAR

```
tau = min(1, norm(f_grad(x_k))^3 / delta * ...  
          f_grad(x_k)' * f_hess(x_k) * f_grad(x_k));  
  
p_k = -tau * delta * f_grad(x_k) / norm(f_grad(x_k));  
  
rho = (f_eval(x_k) - f_eval(x_k + p_k)) / ...  
      (m_k([0;0]) - m_k(p_k));  
  
end
```

