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COURSE: BSc computer Engineering

Question 1. a)

```
a = input("Enter your vector a as [a b c]: ");
b = input("Enter your vector b as [a b c]: ");
dot_ab = dot(a,b);
norm_a = norm(a);
norm_b = norm(b);
angle = acosd(dot_ab/(norm_a*norm_b));
fprintf("The dot product of a and b is: %d", dot_ab)
```

The dot product of a and b is: 200

```
fprintf("The angle is: %.2f degrees", angle)
```

The angle is: 7.37 degrees

Question 2. a)

```
figure;
[X,Y,Z] = sphere(50);
colormap(winter(10))
colorbar
radius = sqrt(36);
% Multiply the respective x,y,z coordinates by the radius(since radius = 1)
X2 = X * radius;
Y2 = Y * radius;
Z2 = Z * radius;

% To include the x,y,z coordinates, to define the center of the
% sphere add or subtract them respectively.
surf(X2-1,Y2-2 ,Z2-4)
shading flat;
title('$Center = (1, 2, 4) \quad radius = \sqrt{36} \quad units$', 'Interpreter', "latex")
xlabel('X-axis'); ylabel('Y-Axis'); zlabel('Z-Axis');
grid on; grid minor;
axis equal
```

$Center = (1, 2, 4)$ $radius = \sqrt{36}$ units

