

$$\therefore d_{SE} = F(M_{SE}) - F(M)$$

$$= (x_p + 2)^2 + (y_p - \frac{3}{2})^2 - R^2 - (x_p + 1)^2 - (y_p - \frac{1}{2})^2 + R^2$$

$$= x_p^2 + 4x_p + 4 + y_p^2 - 3y_p + \frac{9}{4} - x_p^2 - 2x_p - 1 - y_p^2 + y_p - \frac{1}{4}$$

$$= 2x_p - 2y_p + 5$$

$$\therefore d_{init} = 8x_p - 4y_p + 5$$

$$\therefore dE = 8x_p + 12$$

$$\therefore dSE = 8x_p - 8y_p + 20$$

```
void MidPointCircle (int radius, int value) {
```

```
    int x_p = 0;
```

```
    int y_p = radius;
```

```
    int dinit = 8 * x_p - 4 * y_p + 5
```

```
    circlePoint (x_p, y_p, value);
```

```
    while (y_p > x_p) {
```

```
        if (dinit < 0) {
```

```
            dinit = dinit + 8 * x_p + 12;
```

```
        }
```

```
        else {
```

```
            dinit = dinit + 8 * x_p - 8 * y_p + 20;
```

```
            y_p--;
```

```
            x_p++;
```

```
            circlePoint (x_p, y_p, value);
```

```
        }
```

```
    }
```