Use the Table of Integrals in your textbook to evaluate the integral.[1]

$$\int \frac{\sin(2\theta)}{\sqrt{5-\sin(\theta)}}\,\mathrm{d}\theta$$

As we write this, it is January 26, 2016. Nobody uses tables to integrate any longer. We'll use Wolfram|Alpha (W|A).

For the input, we'll use x as the variable because for W|A, it is easier to type than θ. Using Mathematica format, the input is

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Integrate[Sin[2*x]/Sqrt[5-Sin[x]],x]
```

and we get

$$\int \frac{\sin(2x)}{\sqrt{5-\sin(x)}}\,dx = \frac{1}{3}\left(-4\sqrt{5-\sin(x)}\,\sin(x) - 40\sqrt{5-\sin(x)} + 40\sqrt{5}\right) + \text{constant}$$

Integrate[Sin[2∗x]/Sqrt[5−Sin[x]],x] | Computed by Wolfram|Alpha

Thus,

$$\int \frac{\sin(2\theta)}{\sqrt{5-\sin(\theta)}}\,\mathrm{d}\theta = \frac{1}{3}\left(-4\sin(\theta)\sqrt{5-\sin(\theta)} - 40\sqrt{5-\sin(\theta)} + 40\sqrt{5}\right) + C$$

Since $40\sqrt{5}$ is a constant, another acceptable form is

$$= -\frac{4}{3}\sin(\theta)\sqrt{5-\sin(\theta)} - \frac{40}{3}\sqrt{5-\sin(\theta)} + C$$

and we can factor to get

$$= -\frac{4}{3}\sqrt{5-\sin(\theta)}\,(\sin(\theta)+10) + C$$

[1] Stewart, *Calculus, Early Transcendentals*, p. 513, #20.