C3 Simpsons Rule Questions

Specimen

2. Use Simpson's Rule with five ordinates to evaluate the integral

$$\int_1^2 \sqrt{1+x^4}\,\mathrm{d}x\,.$$

Show your working and give your answers correct to two decimal places. [4]

2005 Summer

1. Use Simpson's Rule with five ordinates to find an approximate value for

$$\int_0^1 \sqrt{1+x^5}\ \mathrm{d}x.$$

Show your working and give your answer correct to three decimal places. [4]

2006 Winter

1. Use Simpson's Rule with five ordinates to find an approximate value for

$$\int_1^2 \sqrt{2+x^4}\ \mathrm{d}x.$$

Show your working and give your answer correct to three decimal places. [4]

2006 Summer

1. Use Simpson's Rule with five ordinates to find an approximate value for

$$\int_1^2 \sqrt{\ln x}\ \mathrm{d}x.$$

Show your working and give your answer correct to three decimal places. [4]

2007 Winter

1. *(a)* Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_1^{1.8} \ln(1+x^2)\,\mathrm{d}x.$$

Show your working and give your answer correct to three decimal places. [4]

(b) Use your answer to *(a)* to deduce an approximate value for

$$\int_1^{1.8} \ln\sqrt{1+x^2}\,\mathrm{d}x.$$

[1]

2007 Summer

1. Use Simpson's Rule with five ordinates to find an approximate value for

$$\int_1^{1.4} \frac{1}{2+\ln x}\,\mathrm{d}x.$$

Show your working and give your answer correct to three decimal places. [4]

2008 Winter

1. Use Simpson's Rule with five ordinates to find an approximate value for

$$\int_0^{0.8} \mathrm{e}^{x^2}\,\mathrm{d}x.$$

Show your working and give your answer correct to four decimal places. [4]

2008 Summer

1. Use Simpson's Rule with five ordinates to find an approximate value for

$$\int_0^1 \sqrt{1+\mathrm{e}^x}\,\mathrm{d}x.$$

Show your working and give your answer correct to three decimal places. [4]

2009 Winter

1. Use Simpson's Rule with five ordinates to find an approximate value for

$$\int_0^{\frac{2\pi}{9}} \ln(\cos x)\,dx.$$

Show your working and give your answer correct to four decimal places.

Deduce an approximate value for

$$\int_0^{\frac{2\pi}{9}} \ln(\cos^2 x)\,dx.$$

[5]

2009 Summer

1. Use Simpson's Rule with five ordinates to find an approximate value for

$$\int_1^{1\cdot8} \sqrt{8+x^3}\,dx\,.$$

Show your working and give your answer correct to four decimal places. [4]

2010 Winter

1. Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_0^1 \ln(1+e^x)\,dx.$$

Show your working and give your answer correct to three decimal places. [4]

2010 Summer

1. Use Simpson's Rule with five ordinates to find an approximate value for

$$\int_0^{0\cdot8} \frac{1}{1+e^{2x}}\,dx.$$

Show your working and give your answer correct to four decimal places. [4]

2011 Winter

1. Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_4^6 \frac{1}{3-\sqrt{x}}\,\mathrm{d}x.$$

Show your working and give your answer correct to three decimal places. [4]

2011 Summer

1. *(a)* Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_1^2 \ln(3+x^2)\,\mathrm{d}x.$$

Show your working and give your answer correct to four decimal places. [4]

(b) Use your answer to part *(a)* to deduce an approximate value for the integral

$$\int_1^2 \ln\left(\frac{1}{3+x^2}\right)\mathrm{d}x.$$ [1]

2012 Winter

1. *(a)* Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_0^{\frac{\pi}{3}} \cos^2 x\,\mathrm{d}x.$$

Show your working and give your answer correct to four decimal places. [4]

(b) **Use your answer to part *(a)*** to deduce an approximate value for the integral

$$\int_0^{\frac{\pi}{3}} \sin^2 x\,\mathrm{d}x.$$ [2]

2012 Summer

1. *(a)* Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_0^1 e^{x^2}\,dx.$$

Show your working and give your answer correct to four decimal places. [4]

(b) **Use your answer to part *(a)*** to deduce an approximate value for the integral

$$\int_0^1 e^{x^2+3}\,dx.$$ [2]

2013 Winter

1. Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_1^2 \frac{1}{2+e^x}\,dx.$$

Show your working and give your answer correct to three decimal places. [4]

2013 Summer

1. *(a)* Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_1^3 \ln\left(x^3+6\right)dx.$$

Show your working and give your answer correct to three decimal places. [4]

(b) Use your answer to part *(a)* to deduce an approximate value for the integral

$$\int_1^3 \ln\sqrt{x^3+6}\,dx.$$ [1]

2014 Winter

1. *(a)* Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_0^{\frac{\pi}{3}} \tan^2 x \, \mathrm{d}x.$$

Show your working and give your answer correct to four decimal places. [4]

(b) **Use your answer to part *(a)*** to deduce an approximate value for the integral

$$\int_0^{\frac{\pi}{3}} \sec^2 x \, \mathrm{d}x.$$ [2]

2014 Summer

1. *(a)* Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_0^3 \ln\left(8 + \mathrm{e}^x\right) \mathrm{d}x.$$

Show your working and give your answer correct to two decimal places. [4]

(b) **Use your answer to part *(a)*** to deduce an approximate value for the integral

$$\int_0^3 \ln\left(16 + 2\mathrm{e}^x\right) \mathrm{d}x.$$ [2]

2015

1. *(a)* Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_0^{\frac{4\pi}{9}} \ln(\cos x) \, \mathrm{d}x.$$

Show your working and give your answer correct to four decimal places. [4]

(b) **Use your answer to part *(a)*** to deduce an approximate value for the integral

$$\int_0^{\frac{4\pi}{9}} \ln(\sec x) \, \mathrm{d}x.$$ [1]

2016

1. *(a)* Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_0^{\frac{\pi}{5}} e^{\tan^2 x} dx.$$

Show your working and give your answer correct to five decimal places. [4]

(b) **Use your answer to part *(a)*** to deduce an approximate value for the integral

$$\int_0^{\frac{\pi}{5}} e^{\sec^2 x} dx.$$ [2]

2017

1. *(a)* Use Simpson's Rule with five ordinates to find an approximate value for the integral

$$\int_5^7 \ln\left(1+x^2\right) dx.$$

Show your working and give your answer correct to one decimal place. [4]

(b) **Use your answer to part *(a)*** to deduce an approximate value for the integral

$$\int_5^7 \ln\left(\frac{3}{\sqrt{1+x^2}}\right) dx.$$ [3]