SHENTON COLLEGE

2020 YEAR 12 MATHEMATICS: METHODS
Test 2 (Integration)

/46

NAME:_____

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Calculator-Free **Formula sheet provided** **Working time: 20 minutes** **Marks:** /23

QUESTION 1

[13 marks – 2, 2, 3, 3, 1, 2]

Determine the following.

a) $\int 3x^2 - \frac{1}{\sqrt{x}} + x - 8 \ dx$	b) $\int -2\cos x \sin^4 x \ dx$
c) $\int_{-\pi}^{\pi} \cos 3x \ dx$	d) $\int_0^1 (x^2 - x)^2 \ dx$
e) $\frac{d}{dx}\left(\int_{\pi}^{x} \sin t \ dt\right)$	f) $\int_0^{\pi} \frac{d}{dt}\left(-\cos\frac{t}{2}\right) dt$

QUESTION 2

[6 marks – 1, 2, 3]

Given that $\int_{-1}^{2} f(x)\,dx = 6$ and $\int_{6}^{2} f(x)\,dx = -8$, evaluate the following definite integrals.

a) $\int_{2}^{-1} f(x)\,dx$

b) $\int_{-1}^{6} f(x)dx$

c) $\int_{6}^{2} 3f(x) - 4\ dx$

QUESTION 3

[4 marks]

Given that $f'(x) = \frac{6-x^4}{x^2}$ and $f(x)$ passes through the point $(3, -9)$, determine $f(x)$.

End of Calculator Free Section