Name:______________________________________

Penrith High School

2013

Trial Higher School Certificate Examination

Mathematics

General Instructions

- Reading time – 5 minutes
- Working time – 3 hours
- Write using black or blue pen
- Board-approved calculators may be used
- A table of standard integrals is provided at the end of this paper.
- A multiple choice answer sheet is provided at the end of this paper.
- Show all necessary working for questions 11 – 16 in booklets.
- Work on this question paper will not be marked

Total marks – 100

Section 1 – 10 marks

- Attempt questions 1 – 10
- Allow about 15 minutes for this section.

Section 2 – 90 marks

- Attempt questions 11 – 16
- Allow about 2 hours and 45 minutes for this section.

Questions		
1, 2, 3, 11$\propto$		/12
4, 11β		/7
5, 6		/2
7, 8, 15$\propto$		/7
9, 10, 13		/17
12		/15
14		/15
15 β		/10
16 $\propto$		/4
16β		/11
Total		/100

Section 1

1. Factorise $3x^2+9x$

(A) $3x(x+3)$ (B) $3x(x+9)$ (C) $3x(x+12)$ (D) $3x(3x+3)$

2. $\frac{1}{4}+\frac{x}{8}=?$

(A) $\frac{1+x}{8}$ (B) $\frac{2+x}{8}$ (C) $\frac{1+x}{12}$ (D) $\frac{8+x}{32}$

3. What is the simultaneous solution to the equations $x+y=1$ and $3x-y=7$?

(A) $x=2$ and $y=-1$ (B) $x=3$ and $y=-2$
(C) $x=2$ and $y=3$ (D) $x=3$ and $y=4$

4. What is the centre and radius of the circle with the equation $x^2+y^2+6x-8y-11=0$?

(A) Centre $(-3,-4)$ and radius 36 (B) Centre $(-3,4)$ and radius 36
(C) Centre $(-3,-4)$ and radius 6 (D) Centre $(-3,4)$ and radius 6

5. The chance of a fisherman catching a legal length fish is 4 in 5. If three fish are caught at random, what is the probability that exactly one is of legal length?

(A) $\frac{4}{125}$ (B) $\frac{12}{125}$ (C) $\frac{16}{125}$ (D) $\frac{48}{125}$

6. Sixty tickets are sold in a raffle. There are two prizes. Lincoln buys 5 tickets. Which expression gives the probability that Lincoln wins both prizes?

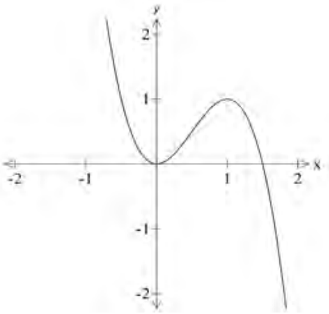
(A) $\frac{5}{60}+\frac{4}{59}$ (B) $\frac{5}{60}+\frac{4}{60}$ (C) $\frac{5}{60}\times\frac{4}{59}$ (D) $\frac{5}{60}\times\frac{4}{60}$

7. What are the *x*-coordinates of the two stationary points to the curve $y=5+3x^3-2x^4$?

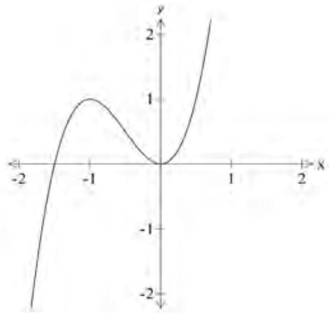
(A) $x=0,\ x=\frac{2}{3}$ (B) $x=0,\ x=\frac{3}{2}$ (C) $x=0,\ x=\frac{8}{9}$ (D) $x=0,\ x=\frac{9}{8}$

8. Which of the following is the graph of $f(x) = 2x^3 - 3x^2$?

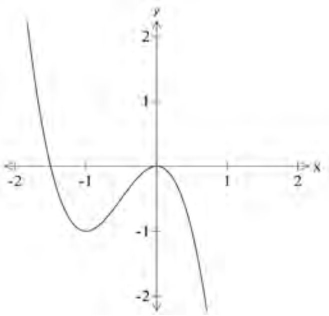
(A)



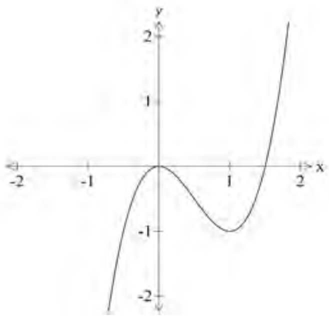
(B)



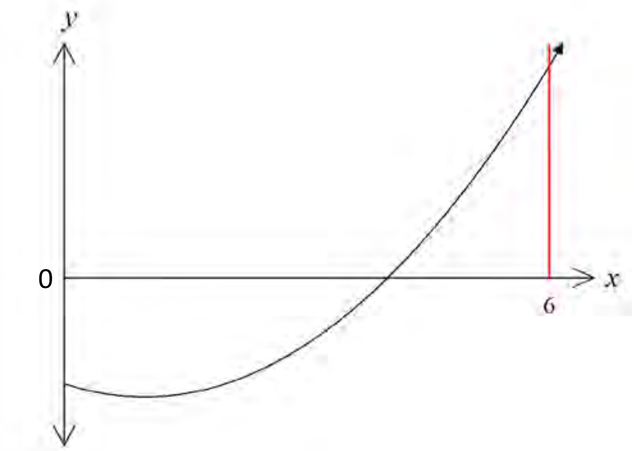
(C)



(D)



9. The diagram below shows the graph of $y = x^2 - 2x - 8$.



What is the correct expression for the area bounded by the x-axis and the curve $y = x^2 - 2x - 8$ between $0 \le x \le 6$?

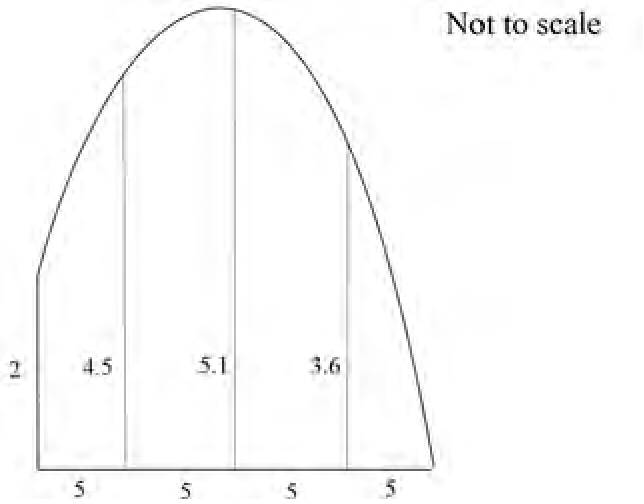
(A) $A = \int_0^5 x^2 - 2x - 8dx + \left|\int_5^6 x^2 - 2x - 8dx\right|$

(B) $A = \int_0^4 x^2 - 2x - 8dx + \left|\int_4^6 x^2 - 2x - 8dx\right|$

(C) $A = \left|\int_0^5 x^2 - 2x - 8dx\right| + \int_5^6 x^2 - 2x - 8dx$

(D) $A = \left|\int_0^4 x^2 - 2x - 8dx\right| + \int_4^6 x^2 - 2x - 8dx$

10. The diagram below shows a native garden. All measurements are in metres.



What is an approximate value for the area of the native garden using the trapezoidal rule with 4 intervals?

(A) 31 m^2 (B) 62 m^2 (C) 71 m^2 (D) 74 m^2

Section 2: Free response
Start each question in a new booklet.

Question 11 Start this question in a new booklet. Marks

∝) i. Evaluate to 1 decimal place: $(1 \cdot 2)^2 + (2 \cdot 1)^2$ 1

ii. Simplify $5\sqrt{3} + \sqrt{20} - 2\sqrt{12}$ 2

iii. Factorise $3x^2 + 8x - 16$ 2

iv. Solve for n: $|3n - 5| = 4n - 7$ 2

v. Express as a single fraction in simplest form: $\frac{(3x-4)}{2} - \frac{(x+1)}{5}$ 2

β) i. If ∝ and β are the roots of $3x^2 - 6x + 12 = 0$, find the value of:

a. $\propto + \beta$ 1

b. $\propto^2 + \beta^2$ 2

ii. For the equation $x^2 + (m-3)x + m = 0$

a. Find an expression (in simplest form) for the discriminant $b^2 - 4ac$, in terms of m. 1

b. Hence find the values of m for which the equation has two roots. 2

Question 12 Start this question in a new booklet

i. Find the exact value of $\cos\frac{\pi}{6}$ 1

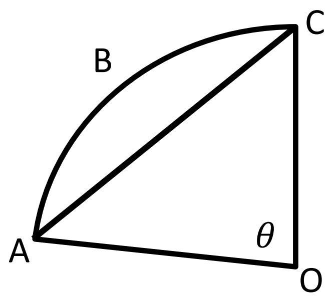
ii. Solve $5cos^2\theta + 2sin\theta - 2 = 0$ for $0 \leq \theta \leq 2\pi$ 2

iii. Sketch $y = 2\cos 3x$ for $0 \leq x \leq 2\pi$. 2

iv. Differentiate $sin2x$ 1

v. Prove that $\frac{sin\theta cos^2\theta - sin^3\theta}{2cos^3\theta - cos\theta} = tan\theta$ 2

vi. The diagram shows a sector OAC with area $90\pi cm^2$ and OA = 15 cm.

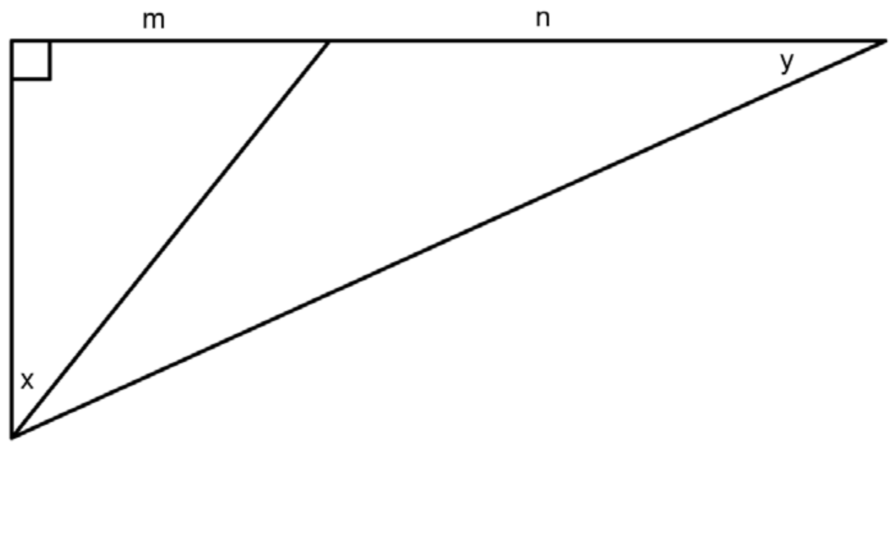


Not to scale

a. Find the size of θ in radians. 2

b. Find the perimeter of the segment ABC. Give your answer correct to the nearest cm. 3

vii. In the diagram, prove that tan x tan y $= \frac{m}{m+n}$ 2

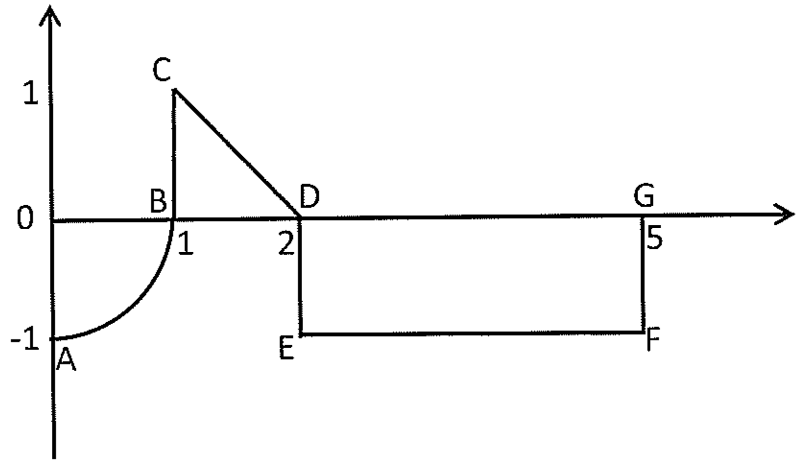


Question 13 Start this question in a new booklet

i. The gradient of a curve is given by $\frac{dy}{dx} = 6x^2 - 6$. The curve passes through the point (2, -1). Find the equation of the curve. 2

ii. By first constructing a table of values, use Simpson's rule with 5 function values to approximate the area enclosed between the curve $y = \frac{1}{5-x}$, the x-axis and the lines $x = 0$ and $x = 4$. Answer correct to 2 significant figures. 3

iii. A function, $y = f(x)$, is drawn below and represented by the curve ABCDEFG. Note: AB is an arc of a circle, centre (0, 0) and radius 1 unit.



a. Show that the area enclosed between the curve $y = f(x)$, the x axis and the ordinates $x = 0$ and $x = 5$ is $\frac{\pi+14}{4}$. 2

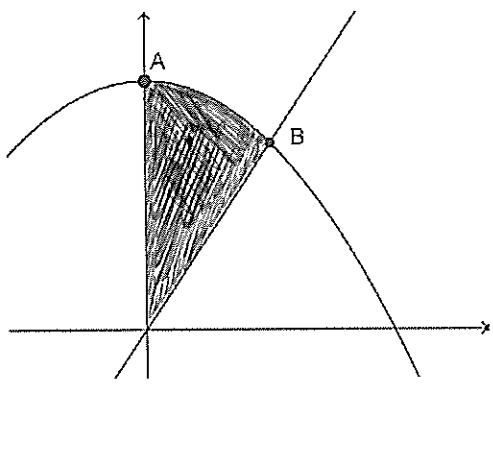
b. For the above information, find the value of $\int_0^5 f(x)dx$. Leave your answer in terms of π. 2

iv. In the diagram, the shaded region is bounded by the parabola $y = -x^2 + 1$, the y-axis and the line $y = \frac{3x}{2}$.

a. Find A, the y-intercept of the parabola $y = -x^2 + 1$. 1

b. Find B, the point of intersection of the parabola and the line. 2

c. Find the volume of the solid formed when the shaded region is rotated about the y-axis. 3



Question 14 Start this question in a new booklet.

i. Solve $3log_7 2 = log_7 x - log_7 4$ 2

ii. Differentiate the following with respect to x:

a. $x^2 log_e x$ 2

b. $\frac{e^x}{3x-2}$ 2

iii. Find $\int 5e^{2x}\,dx$ 1

iv. Find $\int \frac{4}{2x-7}\,dx$ 2

v. Given that $\frac{d}{dx}\left(e^{x^2}\right) = 2xe^{x^2}$, evaluate $\int_0^1 xe^{x^2}\,dx$. 2

vi. Find the equation of the tangent to the curve $y = 2xe^x$ at the point $(1, e)$. 2

vii. Find the area enclosed by the curve $y = log_e x$, the x axis and the line $x = 2$. 2

Question 15 Start this question in a new booklet.

∝) Consider the curve given by $y = x^3 - 3x^2 - 9x + 1$.

i. Find $\frac{dy}{dx}$ 1

ii. Find the coordinates of the two stationary points. 2

iii. Determine the nature of the stationary points. 1

iv. Sketch the curve clearly showing stationary points and y intercept. 1

β) i. A particle moves in a straight line so that its displacement, x metres from a fixed point on a line, is given by $x = t + \frac{25}{t+2}$ where t is measured in seconds.

a. Find the particle's initial position. 1

b. Find expressions for the velocity and acceleration in terms of t. 2

c. Find when and where the particle is at rest. 2

d. Find the limiting velocity of the particle. 1

ii. The number N of bacteria in a culture at a time t seconds is given by the equation $N = 25\ 000e^{0.007t}$

a. What is the number of bacteria initially? 1

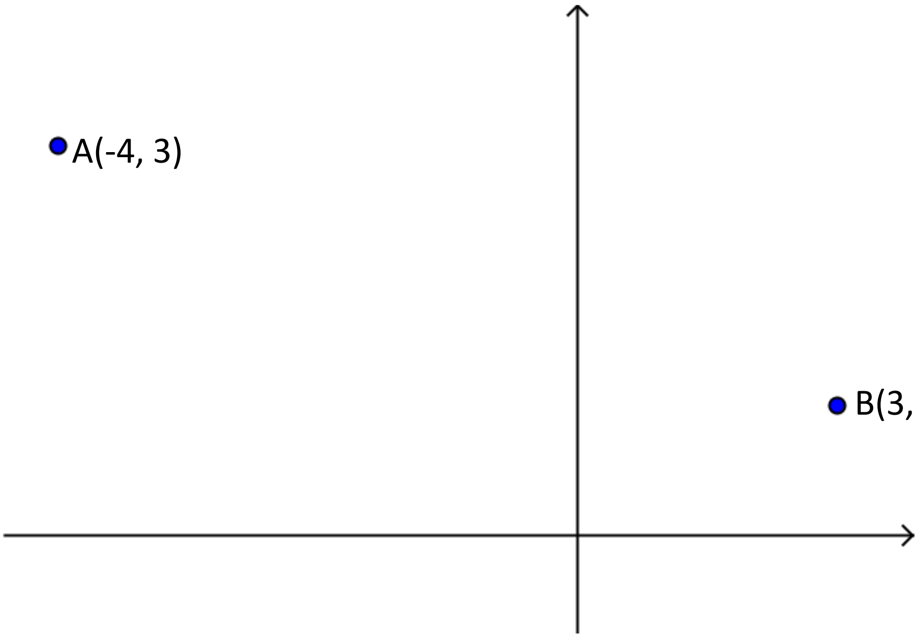
b. Determine the number of bacteria after 30 seconds (to the nearest whole number). 1

c. After what time period will the number of bacteria have doubled? 1

d. At what rate is the number of bacteria increasing when $t = 30$ seconds? 1

Question 16 Start this question in a new booklet.

∝)



i. Find the gradient of AB. 1

ii. Find the midpoint of AB. 1

iii. Show that the equation of the perpendicular bisector of AB is $14x - 4y + 15 = 0$. 1

iv. What is the perpendicular distance of the line found in part iii to the origin (0, 0)? 1

β) i. An arithmetic series has first term 3 and common difference 4. 3

a. Find the 17th term.

b. Find the sum of the tenth to the twentieth terms (inclusive).

ii. The sum of the first 8 terms of a geometric series is 17 times the sum of its first 4 terms. Find the common ratio. 2

iii. Colin borrows \$30 000 to buy a new car. He is charged an interest rate of 15% pa, calculated and compounded monthly, and an amount M is repaid every month. If A_n is the amount owing after n months, show that

a. $A_2 = 30\ 000 \times 1.0125^2 - M(1 + 1.0125)$ 1

b. Hence, show that $A_n = \$30\ 000 \times 1.0125^n - M(\frac{1.0125^n - 1}{0.0125})$ 1

c. Find the value of M, to the nearest cent, if the loan is repaid at the end of 7 years. 2

d. How much extra, in total, will be repaid if the loan is taken over 10 years? (Answer to the nearest dollar) 2

2013 TRIAL MATHEMATICS SOLUTIONS

Q1-10 at end

QUESTION 11

a) i) 5.9 ✓ (1)

ii) $5\sqrt{3} + \sqrt{20} - 2\sqrt{12}$

$5\sqrt{3} + \sqrt{4\times5} - 2\sqrt{4\times3}$

$5\sqrt{3} + 2\sqrt{5} - 4\sqrt{3}$ ✓ (2)

$= \sqrt{3} + 2\sqrt{5}$ ✓

iii) $3x^2 + 8x - 16$

$3x$ ╳ -4

x ╳ 4

$(3x-4)(x+4)$ ✓ ✓ (2)

iv) $|3n-5| = 4n-7$

$3n-5 = 4n-7$, $2 = n$, $(1=1)$ ✓ $n=2$ is a solution

$5-3n = 4n-7$, $-7n = -12$, $n = 12/7$, $(-3 \neq 4)$ ✓ $n=12$ not sol'n. (2)

v) $\frac{3x-4}{2} - \frac{x+1}{5}$

$\frac{15x-20-(2x+2)}{10}$

$\frac{15x-20-2x+2}{10}$ ✓

$\frac{13x-22}{10}$ ✓ (2)

b) i) a) $\alpha+\beta = -\frac{b}{a} = \frac{6}{3} = 2$ ✓ (1)

b) $\alpha^2+\beta^2 = (\alpha+\beta)^2 - 2\alpha\beta$

$\alpha\beta = \frac{12}{3} = 4$ ✓

$\alpha^2+\beta^2 = 2^2 - 2(4)$ (2)

$= 4-8$

$= -4$ ✓

ii) $x^2 + (m-3)x + m = 0$

a) $\Delta = b^2 - 4ac$

$= (m-3)^2 - 4(1)(m)$

$= m^2 - 6m + 9 - 4m$

$= m^2 - 10m + 9$ (1)

m ╳ -9

m ╳ -1

$= (m-9)(m-1)$ ✓

b) $\Delta > 0$ has two unequal roots

$\Delta > 0$

$(m-9)(m-1) > 0$

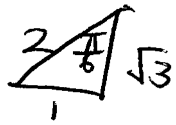
$m=9,\ m=1$ (2)

$m > 9$ ✓

$m < 1$ ✓

to have two real distinct roots.

p12. i) $\cos\frac{\pi}{6} = \boxed{\frac{\sqrt{3}}{2}}$



(ii) $5\cos^2\theta + 2\sin\theta - 2 = 0, \quad 0 \leq \theta \leq 2\pi$

$5(1-\sin^2\theta) + 2\sin\theta - 2 = 0$

$-5\sin^2\theta + 2\sin\theta + 3 = 0$

$5\sin^2\theta - 2\sin\theta - 3 = 0$

Let $x = \sin\theta$ $\quad (5x-5)(5x+3) = 0 \quad$ × −15, + −2: −5, 3

$x = 1$ or $-3/5$

$\sin\theta = 1$

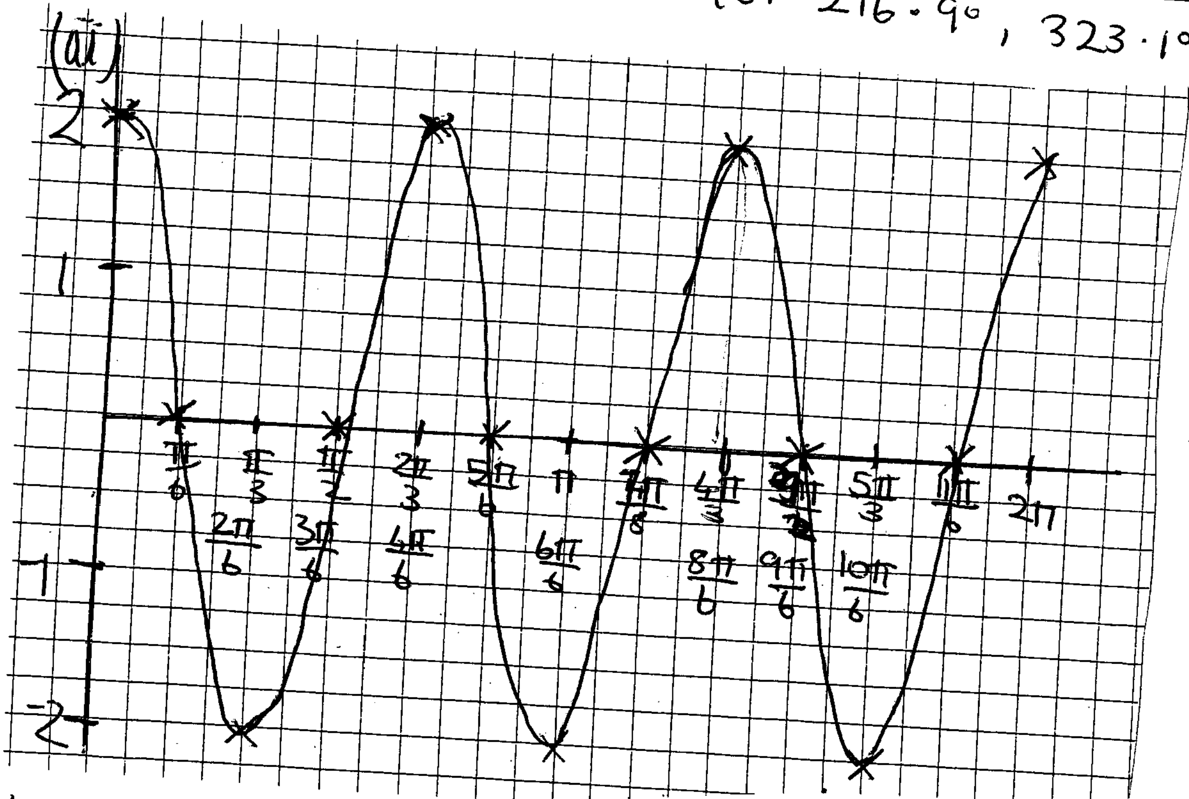
$\therefore \boxed{\theta = \frac{\pi}{2}}$ (or 1.570)

$\sin\theta = -3/5$ $\quad 2\pi - 0.6435$, $\pi + 0.6435$

$\therefore \theta = 3.785$ or 5.640 (to 4 SF)

(or 216.9°, 323.1°)

(iii)



Period $= \frac{2\pi}{3}$

Amplitude $= 2$

(iv) $\frac{d}{dx}(\sin 2x) = 2\cos 2x$

(v) $LHS = \frac{\sin\theta\cos^2\theta - \sin^3\theta}{2\cos^3\theta - \cos\theta} = \frac{\sin\theta(\cos^2\theta - \sin^2\theta)}{\cos\theta(2\cos^2\theta - 1)}$

$= \frac{\sin\theta(\cos^2\theta - (1-\cos^2\theta))}{\cos\theta(2\cos^2\theta - 1)} = \frac{\sin\theta(2\cos^2\theta - 1)}{\cos\theta(2\cos^2\theta - 1)}$

$= \frac{\sin\theta}{\cos\theta} = \tan\theta = RHS$

(2)

12

vi) a) $A = \frac{1}{2} r^2 \theta$

$90\pi = \frac{1}{2}(15)^2 \theta$

$\theta = \frac{180\pi}{225} = \boxed{\frac{4\pi}{5}}$

b) $L = r\theta$

$= 15 \times \frac{4\pi}{5} = \underline{12\pi}$

$AC^2 = 15^2 + 15^2 - 2 \times 15 \times 15 \cos \frac{4\pi}{5}$

$= 450 - 450 \cos \frac{4\pi}{5}$

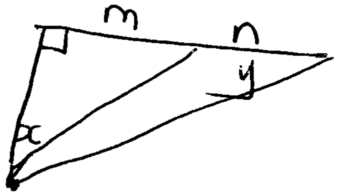
$= 814 \cdot 05 \ldots$

$\underline{AC = 28 \cdot 53} \ldots$

$P = AC + 12\pi$

$\underline{P = 66 \text{ cm}}$ (to nearest cm)

(vii)



$\underline{\tan x} = \frac{m}{h} \left(\frac{opp}{adj}\right)$ $\tan y = \frac{h}{m+n}$

(SOHCAHTOA)

$\tan x \cdot \tan y = \frac{m}{\cancel{h}} \times \frac{\cancel{h}}{m+n}$

$= \boxed{\frac{m}{m+n}}$

Q13

i) $\frac{dy}{dx} = 6x^2 - 6$.

$y = 2x^3 - 6x + c$

$(2, -1)$.

$-1 = 2(2)^3 - 6(2) + c$.

$-1 = 16 - 12 + c$

$-5 = c$

$\therefore y = 2x^3 - 6x - 5$.

ii)

x	0	1	2	3	4
y	0.2	0.25	$0.\dot{3}$	0.5	1

$A \doteqdot \frac{1}{3}\left[0.2 + 4(0.25 + 0.5) + 2(0.\dot{3}) + 1\right]$

$= \frac{1}{3}\left[1.2 + 3 + 0.\dot{6}\right]$

$= \frac{1}{3}\left[4.8\dot{6}\right]$

$= 1.6\dot{2}$

iii) a) $A = \frac{1}{4}\pi + \frac{1}{2} + 3$

$= \frac{\pi + 2 + 12}{4}$

$= \frac{\pi + 14}{4}$

b) $\int_0^5 f(x)\,dx = -\frac{1}{4}\pi + \frac{1}{2} - 3$

$= \frac{-\pi + 2 - 12}{4}$

$= \frac{-10 - \pi}{4}$

iv) b) $y = -x^2 + 1$ --- ①

$y = \frac{3x}{2}$ --- ②.

$\therefore \frac{3x}{2} = -x^2 + 1$

$x^2 + \frac{3x}{2} - 1 = 0$.

$2x^2 + 3x - 2 = 0$.

$\frac{(2x + 4)(2x - 1)}{2}$

$\therefore (x + 2)(2x - 1) = 0$

$\therefore x = -2$ & $x = \frac{1}{2}$.

B is in 1st Quad.

$\therefore B\left(\frac{1}{2}, \frac{3}{4}\right)$.

a) $y = -x^2 + 1$

$\therefore A(0, 1)$

c) $V = \pi \int_{\frac{3}{4}}^{1} x_1^2\,dy + \pi \int_0^{\frac{3}{4}} x_2^2\,dy$.

$y = -x^2 + 1$, $x^2 = 1 - y$; $y = \frac{3x}{2}$, $x = \frac{2y}{3}$, $x^2 = \frac{4y^2}{9}$.

$= \pi \int_{\frac{3}{4}}^{1} (1 - y)\,dy + \pi \int_0^{\frac{3}{4}} \frac{4y^2}{9}\,dy$.

$= \pi\left[y - \frac{y^2}{2}\right]_{\frac{3}{4}}^{1} + \frac{4\pi}{9}\left[\frac{y^3}{3}\right]_0^{\frac{3}{4}}$.

$= \pi\left[\left(1 - \frac{1}{2}\right) - \left(\frac{3}{4} - \frac{9}{32}\right)\right] + \frac{4\pi}{27}\left[\frac{27}{64}\right]$

$= \pi\left[\left(\frac{1}{2}\right) - \left(\frac{24 - 9}{32}\right)\right] + \frac{\pi}{16}$

$= \frac{\pi}{32} + \frac{\pi}{16}$

$= \frac{3\pi}{32}$

(4)

2U – Trial 2013
Qn(14) – Solution

i $3\log_7 2 = \log_7 x - \log_7 4$

$\log_7 8 = \log_7 \frac{x}{4}$ ✓

$8 = \frac{x}{4} \Longrightarrow x = 32$ ✓

ii a) $y = x^2 \ln x$

$y' = x^2 \cdot \frac{1}{x} + 2x \ln x$

$= x + 2x \ln x$ ✓

$= x(2\ln x + 1)$

b) $y = \dfrac{e^x}{3x-2}$

$y' = \dfrac{(3x-2)e^x - 3e^x}{(3x-2)^2}$ ✓ ✓

iii $\int 5e^{2x}\,dx = \frac{5}{2}e^{2x} + C$ ✓

iv $\int \frac{4}{2x-7}\,dx = 2\ln(2x-7) + C$ ✓ ✓

v $\int_0^1 x e^{x^2}\,dx = \frac{1}{2}\int_0^1 2x e^{x^2}\,dx$

$= \frac{1}{2}\left[e^{x^2}\right]_0^1$ ✓

$= \frac{1}{2}(e-1)$ ✓

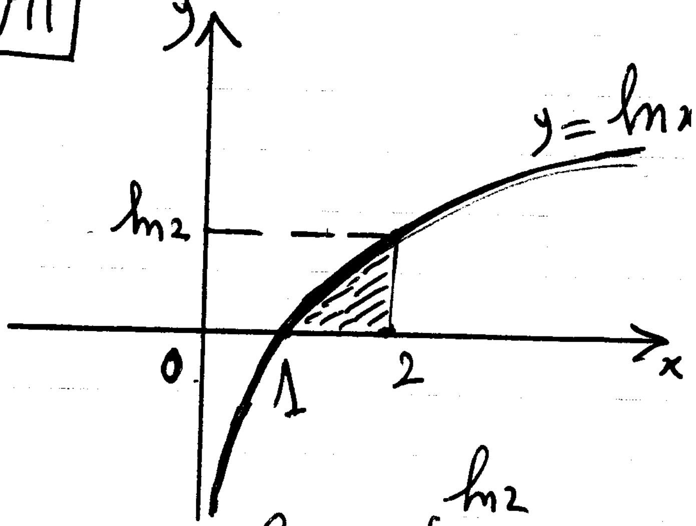
vi $y = 2xe^x$

$y' = 2xe^x + 2e^x, \quad x = 1$

$m = 4e$ ✓

$y - e = 4e(x-1)$ ✓

vii



$\text{Area} = 2\ln 2 - \int_0^{\ln 2} x\,dy$

$= 2\ln 2 - \int_0^{\ln 2} e^y\,dy$ ✓

$= 2\ln 2 - \left[e^y\right]_0^{\ln 2} = 2\ln 2 - 1$ ✓

15. α $y = x^3 - 3x^2 - 9x + 1$

i. $\frac{dy}{dx} = 3x^2 - 6x - 9$

ii. $\frac{dy}{dx} = 0$

$3(x^2 - 2x - 3) = 0$

$(x-3)(x+1) = 0$

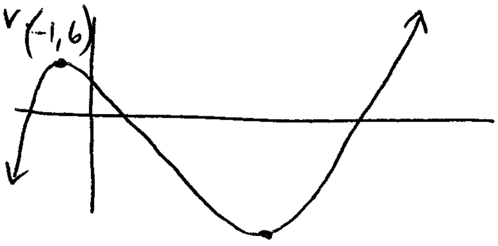
$x = 3, -1$

$(3, -26)$ $(-1, 6)$

iii. $\frac{d^2y}{dx^2} = 6x - 6$

$(3, -26)$ $\frac{d^2y}{dx^2} = 12 > 0$ min

$(-1, 6)$ $\frac{d^2y}{dx^2} = -12 < 0$ max

iv 

β. $x = t + \frac{25}{t+2}$

a. $t = 0$ $x = 12\frac{1}{2}$ metres

b. $\dot{x} = 1 - 25(t+2)^{-2}$

$= 1 - \frac{25}{(t+2)^2}$

$\ddot{x} = 50(t+2)^{-3}$

$= \frac{50}{(t+2)^3}$

c. rest $\dot{x} = 0$

$0 = 1 - \frac{25}{(t+2)^2}$

$1 = \frac{25}{(t+2)^2}$

$t^2 + 4t + 4 = 25$

$t^2 + 4t - 21 = 0$

$(t+7)(t-3) = 0$

$t = 3, -7$ $\therefore t = 3$.

$x = 3 + \frac{25}{5} = 8$ metres.

d. $\dot{x} = 1$

ii. $N = 25000e^{0.007t}$

a. $t = 0$ $N = 25000$

b. $N = 25000e^{0.007 \times 30}$

$= 30841.95$

$= 30842$

c. $50000 = 25000e^{0.007t}$

$2 = e^{0.007t}$

$t = \frac{\ln 2}{0.007} = 99.02$ sec

d. $\frac{dN}{dt} = 0.007 \times 25000e^{0.007 \times 30}$

$= 0.007 \times 30841.95$

$= 215.89$ bacteria/second

16) α) i) $m_{AB} = \frac{1-3}{3+4} = -\frac{2}{7}$ (1)

ii) $M_{AB} = \left(\frac{-4+3}{2}, \frac{3+1}{2}\right)$

$= \left(-\frac{1}{2}, 2\right)$ (1)

iii) $y - y_1 = m(x - x_1)$

$y - 2 = \frac{7}{2}\left(x + \frac{1}{2}\right)$

$2y - 4 = 7x + \frac{7}{2}$

$4y - 8 = 14x + 7$

$14x - 4y + 15 = 0$ (1)

iv) $d_\perp = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2+b^2}}$ (0,0)

$= \frac{|14(0) - 4(0) + 15|}{\sqrt{14^2 + (-4)^2}}$

$\therefore d_\perp = \frac{15}{\sqrt{212}}$ or $\frac{15}{2\sqrt{53}}$

or $\frac{15\sqrt{53}}{106}$

or $\doteqdot 1.03$ units (1)

β) i) a) $a = 3$, $d = 4$

$T_n = a + (n-1)d$

$T_{17} = 3 + (16)4$
$= 67$ (1)

b) $S_{20} - S_{10} + T_{10}$

$S_n = \frac{n}{2}[2a + (n-1)d]$

$S_{10} = 5(6 + (9)4)$
$= 210$

$S_{20} = 10(6 + (19)4)$
$= 820$ ✓

$T_{10} = 3 + (9)4$
$= 39$

$\therefore$ Sum $= 820 - 210 + 39$
$= 649$ ✓ (2)

16 β ii. $S_8 = 17 S_4$

$\frac{a(r^8-1)}{r-1} = \frac{17a(r^4-1)}{r-1}$

$r^8 - 1 = 17(r^4 - 1)$

$(r^4-1)(r^4+1) = 17(r^4-1)$

$r^4 + 1 = 17$

$r^4 = 16$

$r = \pm 2$

$\therefore r = 2$.

16) B) iii) a) $A_0 = \$30{,}000 \quad ; \quad r = 1.0125$

$A_1 = 30000 \times 1.0125 - m$

$A_2 = A_1 \times 1.0125 - m$

$= (30000 \times 1.0125 - m)\,1.0125 - m$

$= 30000 \times 1.0125^2 - 1.0125m - m$

$\therefore A_2 = 30000 \times 1.0125^2 - m(1+1.0125)$ (1)

b) $A_3 = A_2 \times 1.0125 - m$

$= [30000 \times 1.0125^2 - m(1+1.0125)]\,1.0125 - m$

$= 30000 \times 1.0125^3 - m(1+1.0125+1.0125^2)$

$\therefore A_n = 30000 \times 1.0125^n - m(1+1.0125+1.0125^2 + \ldots 1.0125^{n-1})$

with common ratio 1.0125

and Sum $= \dfrac{1.0125^n - 1}{1.0125 - 1}$

Hence $A_n = 30000 \times 1.0125^n - m\left(\dfrac{1.0125^n - 1}{0.0125}\right)$ (1)

c) $30000 \times 1.0125^{84} - m\left(\dfrac{1.0125^{84}-1}{0.0125}\right)$ ✓

$m = \dfrac{0.0125 \times 30000 \times 1.0125^{84}}{1.0125^{84} - 1}$

$A_{84} = \$578.90$ ✓ (2)

d) $84 \times \$578.90 = \$48\,627.82$ ✓

$A_{120} = 30000 \times 1.0125^{120} - m\left(\dfrac{1.0125^{120} - 1}{0.0125}\right)$

$= \$58\,080.58$ ✓

$\therefore$ extra paid $= \$58\,080.58 - 48\,627.82$

$= \$9453 \tfrac{1}{2} \rightarrow (9452.76)$ (2)

Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

Sample: 2 + 4 =

(A) 2	(B) 6	(C) 8	(D) 9
A ○	B ●	C ○	D ○

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

A ● B ⊗ C ○ D ○

If you change your mind and have crossed out what you consider to be the correct answer, then indicate the correct answer by writing the word *correct* and drawing an arrow as follows:

correct ↓

A ⊗ B ⊗ C ○ D ○

ANSWERS

Start Here →

1.	A ●	B ○	C ○	D ○
2.	A ○	B ●	C ○	D ○
3.	A ●	B ○	C ○	D ○
4.	A ○	B ○	C ○	D ●
5.	A ○	B ●	C ○	D ○
6.	A ○	B ○	C ●	D ○
7.	A ○	B ○	C ○	D ●
8.	A ○	B ○	C ○	D ●
9.	A ○	B ○	C ○	D ●
10.	A ○	B ○	C ●	D ○

Section 1