Name : _____

Teacher : _____

Sydney Technical High School

2009 August Common Test

Section 2

Part B (20 marks)

General Instructions

- Write using black or blue pen
- You may use pencil to draw or complete diagrams
- Attempt all questions
- Calculators may be used in Section 2
- Answer the questions in the space provided
- Show all working

Question 56	Question 57	Question 58	Question 59	Question 60	**Total**

Question 56 (4 marks) **Marks**

a) Kevin buys a car for $34 000. 1

Calculate the value of this car after 8 years if it depreciates at the rate of 18% p.a.

---

b) Sally is normally paid $18.40 per hour. 1

Any overtime is paid at time and a half rates.

After working 9 hours one day, Sally is paid $193.20.

How many hours overtime did she work ?

---

c) Draw a neat sketch of $y = x^2 + 2x - 8$ showing all intercepts. 2

Question 57 (4 marks) **Marks**

a) The results of a class test are recorded below :

2 , 3 , 10 , 8 , 3 , 9 , 9 , 7 , 6 , 5 , 4 , 9 , 8

i) Find the mode of these scores. **1**

---

ii) Find the median of these scores. **1**

---

iii) Find the inter-quartile range of these scores. **1**

---

b) **1**

Score	Frequency
5	x
8	7

What value of x would give a mean of 6
for the scores in this frequency distribution table?

Question 58 (4 marks)

a) Solve simultaneously for x and y. **Marks**

$$3x - y = 16$$
$$5x + 2y = 34$$

2

---

b) Solve $2x^2 - 11x + 5 = 0$ **1**

---

c) Use the quadratic formula to find the exact solutions to **1**

$$3x^2 + 6x - 2 = 0$$

Question 59 (4 marks)

a) A hat contains 2 blue and 2 red discs.
From this hat, John draws out two discs at random.
The first is not replaced before the second is drawn out.

i) Find the probability that both discs are blue. **1**

---

ii) Find the probability that both discs are the same colour. **1**

---

iii) After drawing the discs out John drops one of the discs and we see that it is blue. **1**
What is the probability now that both discs are blue ?

---

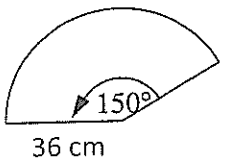
b) Draw a neat sketch of the curve $xy = 4$. **1**

Question 60 (4 marks)

a) Find the volume of a sphere with a radius of 25 cm. 1
Give answer correct to the nearest square centimetre.

b) Find the surface area of a square pyramid with base 20 centimetres 1
and perpendicular height 24 centimetres.

c) The following sector can be folded into a cone by joining its two radii. 2
Calculate the volume of the cone, correct to the nearest whole number.



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- Calculators may be used in Section 2
- Answer the questions in the space provided
- Show all working

Question 56	Question 57	Question 58	Question 59	Question 60	**Total**

Question 56 (4 marks) **Marks**

a) Kevin buys a car for $34 000. **1**

Calculate the value of this car after 8 years if it depreciates at the rate of 18% p.a.

Value = $34000(1-0.18)^8$

$= \$6950.08$

b) Sally is normally paid $18.40 per hour. **1**

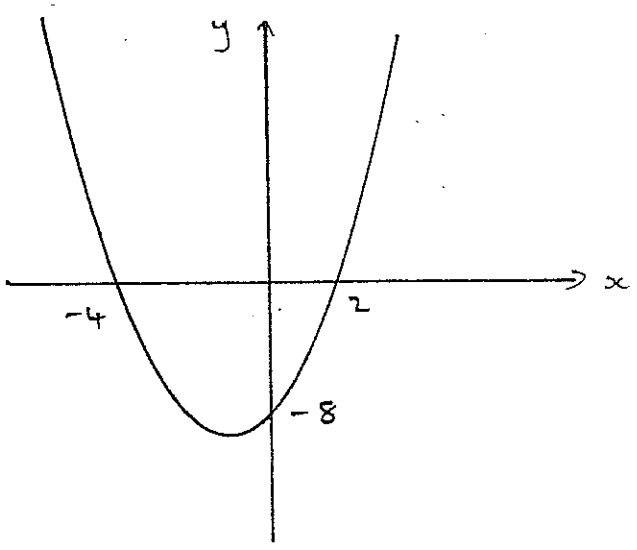
Any overtime is paid at time and a half rates.

After working 9 hours one day, Sally is paid $193.20.

How many hours overtime did she work ?

3 hours

c) Draw a neat sketch of $y = x^2 + 2x - 8$ showing all intercepts. **2**



Question 57 (4 marks) Marks

a) The results of a class test are recorded below :

2, 3, 10, 8, 3, 9, 9, 7, 6, 5, 4, 9, 8

2 3 3 4 5 6 7 8 8 9 9 9 10

i) Find the mode of these scores. 1

9

ii) Find the median of these scores. 1

7

iii) Find the inter-quartile range of these scores. 1

$9 - 3\frac{1}{2} = 5\frac{1}{2}$

b) 1

Score	Frequency
5	x
8	7

What value of x would give a mean of 6
for the scores in this frequency distribution table?

14

Question 58 (4 marks)

a) Solve simultaneously for x and y. Marks

$3x - y = 16$
$5x + 2y = 34$ 2

$x = 6$

$y = 2$

b) Solve $2x^2 - 11x + 5 = 0$ 1

$x = \frac{1}{2}, 5$

c) Use the quadratic formula to find the exact solutions to 1

$3x^2 + 6x - 2 = 0$

$x = \frac{-6 \pm \sqrt{60}}{6}$

or $\left(\frac{-3 \pm \sqrt{15}}{3}\right)$

Question 59 (4 marks)

a) A hat contains 2 blue and 2 red discs.
From this hat, John draws out two discs at random.
The first is not replaced before the second is drawn out.

i) Find the probability that both discs are blue. 1

$\frac{1}{6}$

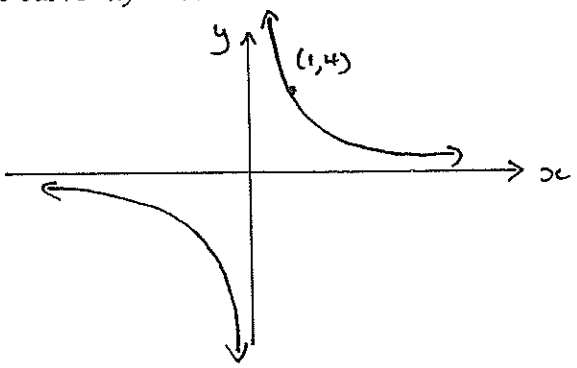
ii) Find the probability that both discs are the same colour. 1

$\frac{1}{3}$

iii) After drawing the discs out John drops one of the discs and we see that it is blue. 1
What is the probability now that both discs are blue ?

$\frac{1}{5}$

b) Draw a neat sketch of the curve $xy = 4$. 1



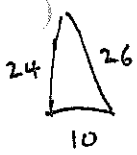
Question 60 (4 marks)

a) Find the volume of a sphere with a radius of 25 cm. 1
Give answer correct to the nearest square centimetre.

$V = \frac{4}{3} \times \pi \times 25^3$

$= 65450 \text{ cm}^3$

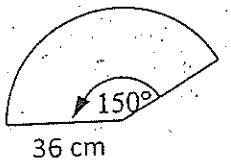
b) Find the surface area of a square pyramid with base 20 centimetres 1
and perpendicular height 24 centimetres.

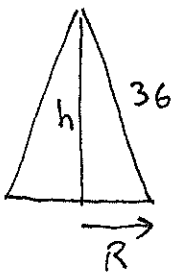


$A = 20^2 + \frac{1}{2} \times 20 \times 26$

$= 1440 \text{ cm}^2$

c) The following sector can be folded into a cone by joining its two radii. 2
Calculate the volume of the cone, correct to the nearest whole number.





$2\pi R = \frac{150}{360} \times 2 \times \pi \times 36$

$R = 15$

$h = \sqrt{36^2 - 15^2}$

$= 32.73$

$\therefore V = \frac{1}{3} \times \pi \times 15^2 \times 32.73$

$= 7712 \text{ cm}^3$