# Kidney Stones

## - I don't recommend them

Have your solutions for
questions #1 and #2 out
for viewing. Don't panic if
you got stuck at some point(s).

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Name _____ Per. ____

## Mock Exam #1
## A practice IB Test

Paper 1

1 ___        6 ___        11 ___
2 ___        7 ___        12 ___
3 ___        8 ___        13 ___
4 ___        9 ___        14 ___
5 ___        10 ___       15 ___

**Paper 1** Total (out of 90) _____

Translated IB Score (out of 7) _____

Paper 2

1 _____  
2 _____  
3 _____  

4 _____  
5 _____  
6 _____  

**Paper 2** Total (out of 90) _____

Translated IB Score (out of 7) _____

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**Question 1**

(a) Find the range of the average body weights of these seven species of mamal.

"Find" means show relevant stages of work

$$529 - 3 = \boxed{526 \text{ kg}}$$ ✓ G2

(b) For the data, ....

(i) calculate r

means show relevand working

.93 .92  
.9223

$$\boxed{r = 0.922}$$ ≤ G2

..... Correlation can always be calculated directly from GDC.

(b)    For the data, ....

    (i)   calculate  r

$r = 0.922$

$\leq$ G2

means show
relevand working

..... Correlation can always
be calculated directly
from GDC.

(ii)    Describe the correlation

essential words → (Very) Strong, positive ✓✓

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(c)    Write down the equation of....

straight
from GDC

$y = 0.000986 x + 0.0923$

.00099 ×

← 3 sig.figs

✓✓

(d)   Use LSRL to estimate

$0.00098583 \, T(36) + .0923391..... = 0.128 \, kg$

$= .127829 \, .....$

✓✓
G2
(A+)'

$\left(9.86 \times 10^{-4}\right) x + .0923$

Question 1 continued

(e)    Find percentage error

$$\left| \frac{.127829... - 0.120}{.120} \right| \times 100 = \boxed{6.52 \, \%}$$

M1 ✓
A1 ✓
(ft)

(f)    State whether it is valid to use the regression line to estimate the average weight of the brain of mice

$$\boxed{\text{Not valid}}$$

A1 ✓

the mouse is smaller than the cat
$\uparrow$ lightest animal
(it would be an extrapolation)

OR   .023 kg is outside the given data range

✓ R1

Add up your marks
for question 1
and record it.

Paper 2

1 ____    4 ____

2 ____    5 ____

3 ____    6 ____

**Paper 2** Total (out of 90) _____

Translated IB Score (out of 7) _____

Question 2
Solution

(a) (i) $222 = \frac{1}{2} x (x+3) + (x+3)(x+5)$  ✓✓✓

(ii) $222 = \frac{1}{2}x^2 + \frac{3}{2}x + x^2 + 5x + 3x + 15$  ← must show

multiply by 2

$444 = x^2 + 3x + 2x^2 + 16x + 30$

$444 = 3x^2 + 19x + 30$
$-444$              $-444$                                  ✓

$0 = 3x^2 + 19x - 414$

(b) ⸨Find the length CD⸩ by solving equation above

Solve $\boxed{0 = 3x^2 + 19x - 414}$ by graphing or with quadratic formula  ✓

$\boxed{X = 9}$     $X = -15\frac{1}{3}$
                    $(or -\frac{46}{3})$              $X = 5$

$CD = X + 3 = 9 + 3 = 12$                              ✓ G2

$\boxed{CD = 12 \text{ cm}}$

(c) Show that angle $B\hat{A}E = 67.4°$

✓✓  $\tan\left(\dfrac{B\hat{A}E}{2}\right) = \dfrac{6}{9}$

or equivalent

$\dfrac{B\hat{A}E}{2} = \tan^{-1}\left(\dfrac{6}{9}\right) = 33.69000$

✓  $B\hat{A}E = 2(33.69000) = 67.380)\ldots$

$= 67.4°$

Need to see both for final mark

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(d) Perimeter ABCDE

$2\sqrt{9^2 + 6^2} + 12 + 2(14)$

$2\sqrt{117} + 12 + 2(14)$

$= 61.6333\ldots$

$= 61.6\ cm$

M1  M1
↑    ↑
for Pythag. Theorm    Add all sides

A1 (f+t) from part b

63 total

2a)

(2a)

$$180 - 67.4° = 112.6 \div 2 = 56.3°$$

$$90° + 56.3° = 146.3°$$
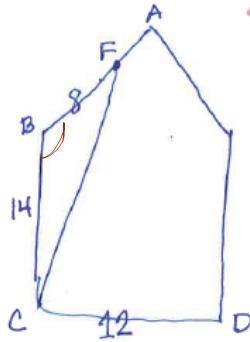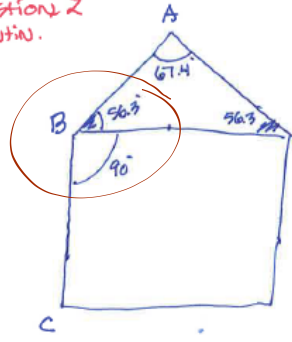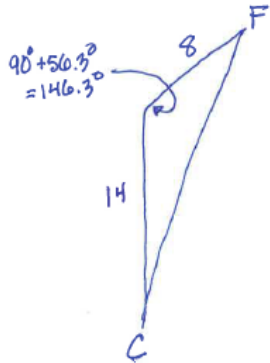
### Cosine Rule

$$CF^2 = 8^2 + 14^2 - 2(8)(14) \cdot \cos(146.3°)$$

$$CF^2 = 446.3577\ldots$$

$$CF = 21.127179\ldots$$

$$\boxed{CF = 21.1 \text{ cm}}$$

Add up
Record for
#2

# Pick the Warm Up

do front side only
[quickly]

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$(a \lor b) \Rightarrow c$

| $a$ | $b$ | $c$ | $a \lor b$ | $c$ | $(a \lor b) \Rightarrow c$ |
|-----|-----|-----|------------|-----|----------------------------|
| T | T | T | T | T | T |
| T | T | F | T | F | F |
| T | F | T | T | T | T |
| T | F | F | T | F | F |
| F | T | T | T | T | T |
| F | T | F | T | F | F |
| F | F | T | F | T | T |
| F | F | F | F | F | T |

$a \Rightarrow (b \land c)$

| $a$ | $b$ | $c$ | $a$ | $b \land c$ | $a \Rightarrow (b \land c)$ |
|-----|-----|-----|-----|------------|------------------------------|
| T | T | T | T | T | T |
| T | T | F | T | F | F |
| T | F | T | T | F | F |
| T | F | F | T | F | F |
| F | T | T | F | T | T |
| F | T | F | F | F | T |
| F | F | T | F | F | T |
| F | F | F | F | F | T |

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**Prove DeMorgan's 2nd Law**

negating an "AND" statement

$\neg (p \land q) = \neg p \lor \neg q$

Back side

| $p$ | $q$ | $\neg p$ | $\neg q$ | $p \land q$ (and) | $\neg (p \land q)$ | $\neg p \lor \neg q$ |
|-----|-----|----------|----------|--------------------|--------------------|-----------------------|
| T | T | f | f | T | f | f |
| T | F | f | T | f | T | T |
| f | T | T | f | f | T | T |
| F | F | T | T | f | T | T |

| p | q | ¬p | ¬q | p∧q | ¬(p∧q) | ¬p ∨ ¬q |
|---|---|----|----|----|--------|---------|
| T | T | F  | F  | T  | F      | F       |
| T | F | F  | T  | F  | T      | T       |
| F | T | T  | F  | F  | T      | T       |
| F | F | T  | T  | F  | T      | T       |

Any questions on Assignment 3
(assigned way last Wed) ?

**p509**

## EXERCISE 15F

**1** Write the converse and inverse for:

   **a** If $5x - 2 = 13$, then $x = 3$.

**(a)** If $x = 3$ then $5x - 2 = 13$.

if $5x - 2 \neq 13$, then $x \neq 3$

**d** If a figure is a parallelogram, then its opposite sides are equal in length.

If a figure has opp sides equal in length, then the figure is a parallelogram.

If a figure is not a par, then then opp sides are not =

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**3** Write down the contrapositives of these statements:

   **a** All rose bushes have thorns.

same as:
*If a plant is a rose bush, then it has thorns.*

Contrapositive:
**If a plant does not have thorns, then it is not a rose bush**

c   No good soccer player has poor kicking skills.

*Same as:*
**If a soccer player is no good, then they have poor kicking skills.**

contrapositive:
**If a soccer player does not have poor kicking skills, then the player is not a bad player.**

e   If a person is fair and clever then the person is a doctor.

Contrapositive:
If a person is not a doctor, then the person is not fair nor clever.

**5** Write down the contrapositive of:

   **b**   $x$ is a number ending in 2   $\Rightarrow$   $x$ is even

**if x is odd, then x is not a number ending in 2.**

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pg 504   15C..... 3c

**3** Use deMorgan's properties to find the negation of:

   **c**    $x < -1$   or   $x > 7$

$$\neg(p \wedge q) = \neg p \vee \neg q$$
$$\neg(p \vee q) = \neg p \wedge \neg q$$

negation

    $x \geq -1$ and $x \leq 7$

$$P \lor (\neg p \land q)$$

| P | q | $\neg p$ | $\neg p \land q$ | $P \lor (\neg p \land q)$ |
|---|---|---|---|---|
| T | T | f | F | T |
| T | f | f | f | T |
| F | T | T | T | T |
| F | f | T | f | F |

I    =
II   =
III  =
IV   =
V    =
VI   :
VII
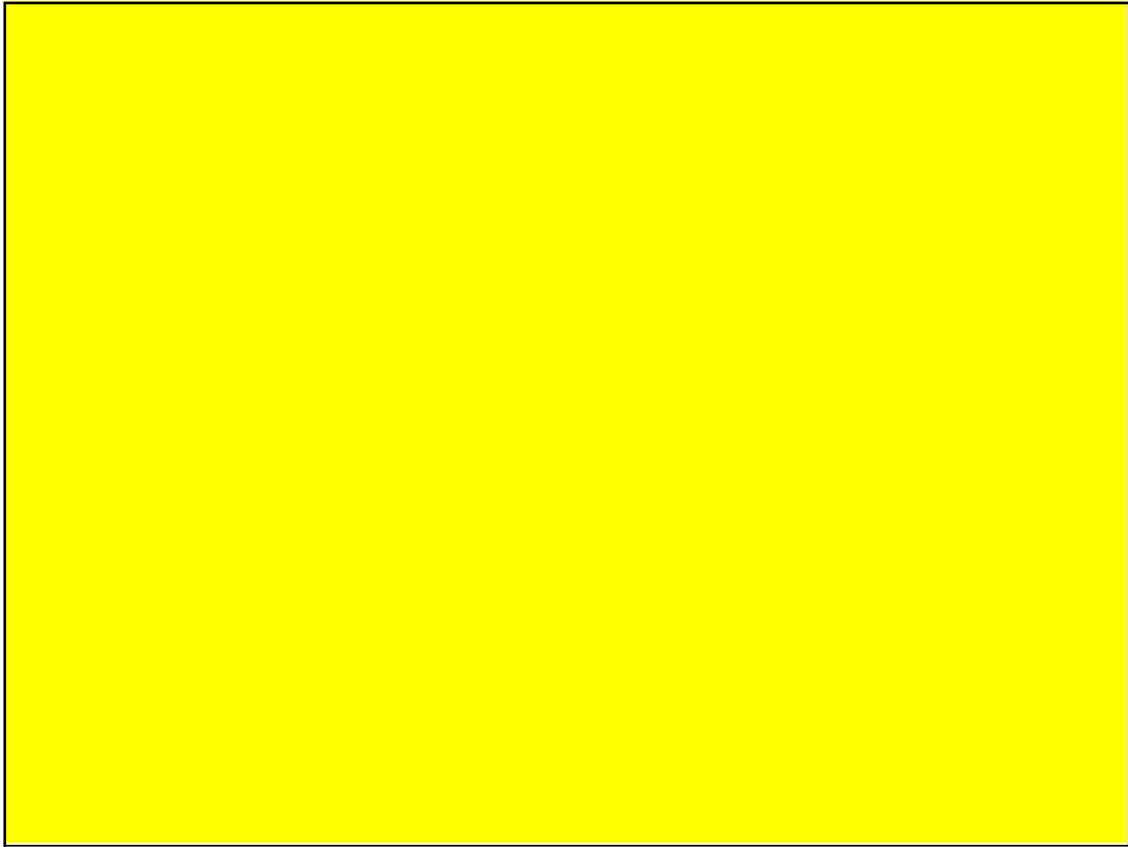
**What would be the issues with setting up a truth table for the following compound proposition?**

$$\neg p \lor (q \land r)$$

AIM: Three Proposition Truth Tables

your notes

will also be set up in a standard way

| P | q | r | | $\neg p \lor (q \land r)$ |
|---|---|---|---|---|
| | | | | |

| P | q | r | ¬p | q ∧ r | ¬p ∨ (q ∧ r) |
|---|---|---|----|-------|--------------|
| T | T | T |    |       |              |
| T | T | F |    |       |              |
| T | F | T |    |       |              |
| T | F | F |    |       |              |
| F | T | T |    |       |              |
| F | T | F |    |       |              |
| F | F | T |    |       |              |
| F | F | F |    |       |              |

| P | q | r | ¬p | q ∧ r | ¬p ∨ (q ∧ r) |
|---|---|---|----|-------|--------------|
| T | T | T | f  | T     | T            |
| T | T | F | f  | f     | f            |
| T | F | T | f  | f     | f            |
| T | F | F | f  | f     | f            |
| F | T | T | T  | T     | T            |
| F | T | F | T  | f     | T            |
| F | F | T | T  | f     | T            |
| F | F | F | T  | f     | T            |

Construct a truth
table for

$$(p \lor q) \lor (p \land \neg r)$$

| p | q | r | | $(p \lor q) \lor (p \land \neg r)$ |
|---|---|---|---|---|
| | | | | |

How many
additional
columns ?

| p | q | r | ¬r | (p∨q) | (p∧¬r) | (p∨q)∨(p∧¬r) |
|---|---|---|----|-------|--------|---------------|
| T | T | T | F  | T     | F      | T |
| T | T | F | T  | T     | T      | T |
| T | F | T | F  | T     | F      | T |
| T | F | F | T  | T     | T      | T |
| F | T | T | F  | T     | F      | T |
| F | T | F | T  | T     | F      | T |
| F | F | T | F  | F     | F      | F |
| F | F | F | T  | F     | F      | F |

BB

| Monday | Tuesday | Wednesday | Thursday | Friday |
|--------|---------|-----------|----------|--------|
| **12**<br><br>**No School** | **13**<br><br>Draft #2 is due today<br><br>*Logic Day 4-*<br><br>Take Home Analysis of #1 | **14**<br>Take Home Analysis of #1 & #2 from Mock Exam<br><br>*Logic Day 5- Review* | **15**<br><br>**Quiz on:**<br>**Logic**<br><br>3-D Geometry problem<br>currency exchange practice | **16**<br><br>**Sequence 1 Arithmetic**<br>**with currency exchange**<br>**practice** |
| **19**<br><br>**Sequence 2**<br>**Geometric**<br><br><br>3-D Geometry problem | **20**<br><br>**Sequence 3 Finance**<br><br>**Sequence 4 -Review** | **21**<br><br>**Quiz on:**<br>**Finance &**<br>**Sequences & Geo**<br><br>**Turn in all Assignments** | **22**<br><br>**No School**<br><br>**Thanksgiving** | **23**<br><br>**No School** |
| **26**<br><br>MockExam Paper 2<br> Question #3 and #4<br><br>Analyze questions 3 & 4 | **27**<br><br>MockExam Paper 2<br> Questions #5 and #6<br><br>Analyze questions 5 & 6 ?? | **28**<br>Instructions for Paper 1<br><br>**MockExam Paper 1**<br>Paper 1 – Questions 1-8<br><br>Take home analysis of Paper 1,<br>questions 1-9 | **29**<br><br>**MockExam Paper 2**<br>Paper 1 – Questions 9-15 | **30**<br><br>Last Day of Trimester<br>-Analyze results of Paper 1,<br>9-15<br>-Review Session Info<br>-Project Strategy<br>-Questions<br>-Brain Breaks |

# Assignment:

*Logic Assignment #4*