Universiteit van Stellenbosch
Fakulteit Opvoedkunde
Departement Kurrikulumstudie
Vakdidaktiek Wiskundige Geletterdheid 174
Toets: 12 November 2005

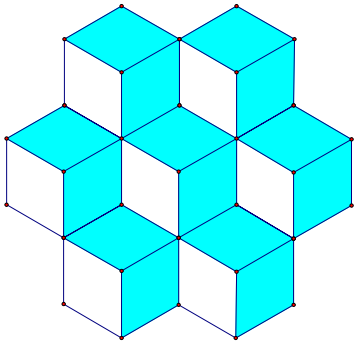
Tyd: 2 uur
Punte: 100
Eksaminator:
A.I. Olivier

Beantwoord al die vrae

E-pos jou antwoorde voor 11:15 aan aio@sun.ac.za

VRAAG 1

Konstrueer so 'n tessellasie van "kubusse".
Bewys dat dit 'n tessellasie is.



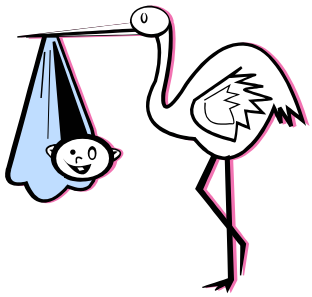
[30]

VRAAG 2

John en Joan verwag hul eersteling. 'n Ryk tante bied hulle 'n keuse van geskenke vir die kind.

Geskenk A: Die kind ontvang R1 000 by geboorte, R2 000 op haar eerste verjaarsdag, R3 000 op haar tweede verjaarsdag, ens., tot haar 21ste verjaarsdag. Dus, sy begin met R1 000 en die geskenk vermeerder dan met R1 000 elke jaar, tot op haar 21ste verjaarsdag.

Geskenk B: Die kind ontvang 10c by geboorte (dis korrek!), 20c op haar tweede verjaarsdag, ens., tot haar 21ste verjaarsdag. Dus, sy begin met 10c en die geskenk verdubbel dan elke jaar, tot op haar 21ste verjaarsdag.



Watter geskenk sou jy kies as jy John en Joan was?

Maak *tabelle* en trek *grafieke* om die volgende te vergelyk en te illustreer:

(1) Die *bedrag wat sy op elke verjaarsdag ontvang*.
Hoe vergelyk die bedrae wat sy op haar 21ste verjaarsdag ontvang?

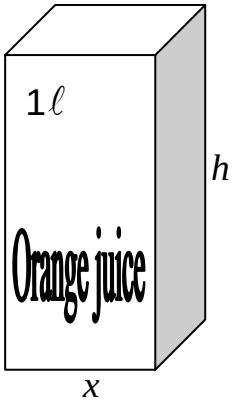
(2) Die *Kumulatiewebedrag (die som) wat sy oor tyd ontvang*.
Hoe vergelyk die totale bedrae wat sy ontvang?

Let op: Ignoreer die rente wat op die geskenke verdien kan word.

[35]

VRAAG 3

'n Vervaardiger wil 'n 1 ℓ (1 000 cm^3) karton boks vir lemoensap maak in die vorm van 'n reghoekige prisma met 'n *vierkantige basis*.



(a) Ondersoek die verband tussen die hoogte h en die sylengte x van die vierkantige basis van veskillende bokse met 'n volume van 1 ℓ.

Trek 'n grafiek van h teenoor x en interpreteer die grafiek.

(b) Ondersoek hoe verskillende waardes van x en h die hoeveelheid karton (d.i. die buite-oppervlakte) benodig vir 'n 1 ℓ boks beïnvloed.

Trek 'n grafiek van die *buite-oppervlakte* teenoor x.
Watter waardes van x en h lewer die beste ontwerp (die boks wat die minste karton benodig)?

[35]

University of Stellenbosch
Faculty of Education
Department Curriculum Studies
Curriculum Studies: Mathematical Literacy 174
Test: 12 November 2005

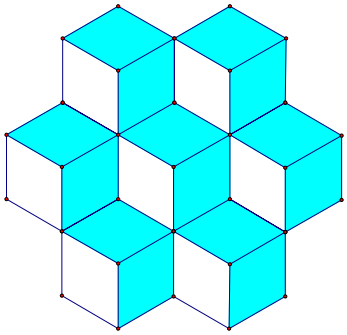
Duration: 2 hours
Marks: 100
Examiner:
A.I. Olivier

Answer all the questions

E-mail your answers before 11:15 to aio@sun.ac.za

QUESTION 1

Construct such a tessellation of "cubes".
Prove that it is a tessellation.



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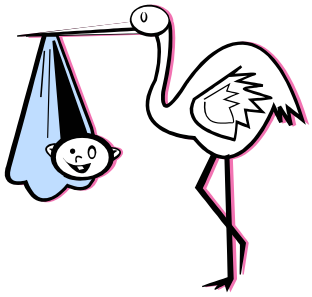
QUESTION 2

John and Joan is expecting their first child. A rich aunt offers them a choice of gifts for the child.

Gift A: The child will receive R1 000 at birth, R2 000 on her first birthday, R3 000 on the second, etc., until her 21st birthday. That is, she starts with R1 000 and then the gift increases by R1 000 each year, until her 21st birthday.

Gift B: The child will receive 10c at birth (that's right!), 20c on her first birthday, 40c on the second, etc., until her 21st birthday. That is, she starts with 10c and then the gift doubles each year, until her 21st birthday.



Which gift would you choose if you were John and Joan?

Make *tables* and draw *graphs* comparing and illustrating:

(1) The *amount she receives on each birthday*.
How do the amounts on her 21st birthday compare?

(2) The *cumulative amount (the sum) she receives over time*.
How do the total amounts compare?

Note: Ignore the interest that may be earned on the investments.

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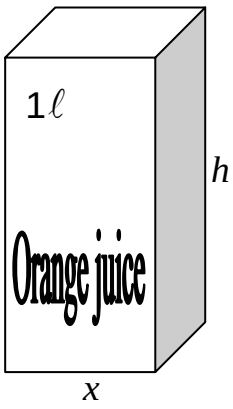
QUESTION 3

A manufacturer wants to make a cardboard box for orange juice in the shape of a cuboid with a *square base* that will hold 1 ℓ (1 000 cm^3).



(a) Investigate the relationship between the height h and the side length x of the square base of different cuboids with a volume of 1 ℓ.
Draw a graph of h against x and interpret the graph.

(b) Investigate how different values of x and h influence the amount of cardboard (the surface area) needed to build a 1 ℓ cuboid box.
Draw a graph of the *surface area* against x.
Which values of x and h give the best design (i.e. the box needing the minimum cardboard)?

[35]