An integrative approach to building professional attributes in a first year nursing course: Description and preliminary analysis of academic numeracy

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Abstract
This paper will describe the characteristics of an academic numeracy component of two new courses designed to build the academic attributes student nurses need to succeed at university and in the nursing profession. It will also report on a project designed to evaluate and improve these courses. This project had a collective case-study design, including quantitative and qualitative methodologies which involved students and academic staff reflecting on curriculum design and assessment. Finally the paper will report on the 2008 courses revised as a result of the evaluation.

Key words: nursing, numeracy, university, e-assessment.

Introduction
Nursing students need to be numerate in order to become successful in their careers. This is reflected in many of the Australian Nursing Council Inc. (ANCI) Competencies (2000) which set the standard for nurses working in Australia (Elliot & Joyce, 2005). However nursing students entering universities today come from much more diverse backgrounds than 20 years ago when nursing began as an undergraduate degree program in Australia. There are concerns about nurses’ standards of numeracy in hospitals (Gladstone, 1995; Santamaria, 1997, Bath & Blais, 1993) and nursing students’ numeracy standards in universities (Weeks, Lyne & Torrance, 2000; Wright, 2007; Gillies, 2004). This is particularly true at the University of Southern Queensland (USQ), a regional university whose median undergraduate student age is 28. USQ enrols about 200 first year undergraduate nursing students every year. With about half of students coming directly from school, the university does recognize this diversity and provides academic skill support, but what is the best way to do this?

In universities, according to Keimig (1983), support that is ‘targeted at specific aspects of learning within academic courses’ (p. 21) is more likely to succeed in improving students’ learning. Moreover nursing literature has identified integrated clinical/academic support as a first year priority (Andrew et., al. 2007). In 2007 a new approach was taken at USQ to embed numeracy in undergraduate nursing within a first year first semester course, MAT1008: Building Professional Nursing Attributes B. The aims of this course were to develop students’ numeracy and Information Technology skills directly linked and highly relevant to their degree. These skills were developed by embedding aspects of other courses taken in the students’ first semester and mindful of courses taken later in the program. IT features were integrated throughout the courses’ structure. The course material was prepared in multi-modal form (i.e.
print, CD, website) through an in-house content creation system. The assessment and other resources were made available online using an easy to use web site with user authentication.

The MAT1008 course was closely linked to a second course, CMS 1008: Building Professional Nursing Attributes A, conducted through the Faculty of Arts. The aims of this course were to develop students’ academic and information literacies and learning, research and communication skills and professional e-portfolios.

The courses took into account a growing discourse on interdisciplinary or ‘pluridisciplinary’ higher education, which sees value in two or more disciplines combining their expertise to jointly address an area of common concern (Davies & Devlin, 2007), in this case the complexities involved in students’ transitions both to university and to future professional nursing practice in an increasingly multifaceted world.

Drawing from experience of over 17 years of academic numeracy support particularly in nursing (Galligan, 2001; Galligan, 2002, Galligan & Pigozzo, 2002; Galligan & Taylor, 2005), the numeracy section of the course was developed in 2006. The two courses, MAT1008 and CMS1008 were then delivered and evaluated in 2007. In light of the experience as well as student and staff feedback, the courses were refined for the 2008 cohort. The next section will explain some of the evaluative aspects of the study before identifying and detailing broad characteristics in the 2008 course.

**Evaluation study**

Throughout the design and delivery of the courses a standard method of evaluation and program development was used (Taylor & Galligan, 2002, developed from Guba & Stufflebeam, 1970, see Figure 1). This model incorporates evaluation priorities in each cycle. A needs assessment was included in the pre-program design and sessions with nursing staff were undertaken as program design evolved to ensure what was being designed reflected the needs of the staff and students. During delivery, ongoing evaluation was undertaken and, due to the online and interactive nature of the course delivery, some improvements were able to be made immediately.

![Figure 1: Model of program development](image)

The CMS/MAT team has commenced an evaluation of the effectiveness of the two courses. This includes, for example, the e-assessment components, the use of digital technologies in the learning context and the pedagogical and technological collaborations developed between the two courses and parallel nursing courses. In a collective case-study design, quantitative and qualitative methodologies are applied with students and academic staff
reflecting on curriculum design and assessment. The data were acquired in three stages: in Stage 1 various forms of feedback were collected from the two courses. This included electronic discussion groups on the bulletin board, reflections in assignments, emails and the standard university student evaluation form. An online end of semester survey of students, focusing on the specific features of the two courses, was administered in Stage 2. Stage 3 will be a replication of Stages 1 and 2 for the 2008 cohort. More detailed explanation of the e-assessment and the evaluation in relation to this can be found in Lawrence et al. (submitted). Results suggest students and staff are extremely supportive of the courses with students reporting increased confidence and competency in numeracy, as well as IT, academic, research and communication skills.

Using our collective experience and from the data from Stages 1 and 2, the following section will first outline the general characteristics of the course, followed by specific examples. It is anticipated this approach will provide a model for other embedded courses.

**Characteristics of an embedded academic numeracy course**

The embedded curriculum includes the following characteristics:

1. Academic numeracy audit
2. Student self audit
3. Student self reflection
4. Flexible approach to accessing curriculum alternatives
5. Flexible content diverse student cohort
6. Flexible integrated scaffolded delivery.

**Academic numeracy audit**

The embedded academic numeracy course was not a replication of a school curriculum, but emerged from the nursing context and the university nursing program. FitzSimons (2006) makes the distinction by focusing on Bernstein’s concepts of vertical and horizontal discourse. While vertical discourse centres on mainly school mathematics, horizontal discourse links closely to numeracy as it is related to on-going practices; is affective; has specific immediate goals and is highly relevant. FitzSimons emphasizes that these discourses are different with different practices and that vertical discourses will not guarantee numerate activity. However parallels to school based mathematics that is needed in the particular context, can be found. As part of a numeracy audit, a literature review was taken to benchmark the content of this course with others in Australia and elsewhere.

**What numeracy is needed?**

World wide there are no benchmark numeracy standards for nurses. However in most countries there are similar standards evident. In the UK there is a move to develop a national framework for learning, teaching and assessment in nursing education (Sabin, 2001) and more specifically a benchmark for nurses at registry. In an article by Golbeck et al. (2005) aspects of numeracy are emphasised that appear important, including drug calculations, administration; fluid balance calculation, patients nutritional needs, intravenous fluid, BMI, plotting and recording data, understanding research and evidence. Johnson and Johnson (2002) identified four component processes – computation; conversion, conceptualisation and critical evaluation. These processes, they say, need to be scaffolded, building on previously learned material. (Coben et al., in press) suggest teaching and assessment in the nursing degree must be able to generate in students: ‘independence; good critical judgement…; proficiency in practice; and accountability to relevant stakeholders…’.

They identify key numeracy areas of:
Cartwright (1996) identified skills of estimation, measurement and recording together with common requirements of volume, blood pressure, weight and girth measurements. She further divided the tasks into ‘simple’, ‘basic’, ‘moderate’ or ‘complex’. Hilton (1999) using the work of Pirie (1987) identified critical mathematics components essential to becoming a numerate nurse:

- Addition of three digit integers
- Subtraction involving three digit integers
- Multiplication involving two digit integers
- Division by an integer between 1 and 9
- Multiplication of two decimal fractions
- Multiplication of two fractions
- Division of two fractions
- Conversion of fractions to decimals
- Conversion of decimals to percentages
- Calculating percentages of integers
- Conversion between SI units
- Multiplication of integers and decimals by 10, 100 and 1000
- Evaluation of expressions of the form \((AXB \div CXD)\)

Pierce and her colleagues (2008) highlighted a fundamental problem in decimals for a significant minority of nursing students. However it is not clear that having these mathematics skills, or at least these skills at 100% competence, are necessary. Sabin, reviewing the literature in 2001, has found direct international comparisons difficult but contains a useful appendix comparing UK, US, Canadian, Australian and Scandinavian tests, highlighting this lack of standardisation with a range of between 50 and 100% competency expected. Research also suggests that poor performance in pencil and paper tests do not correlate highly with competency in practice (Hutton, 1998; Hoyles, Noss & Pozzi, 1999; Kaporg, 1994) and that clinical experience helps nurses to conceptualise the maths into a problem (Wilson, 2003). The course material incorporates all the mathematics and related numeracy skills identified above. But we needed to contextualise this even more to the local context and discipline.

In 2006 an audit of the current course/s and interviews with staff provided an overview of what needed to be included and what needed to be emphasised. Table 1 summarizes the skills identified and some in-context examples. Where possible actual examples involving numeracy from other courses were used and photographs were taken of drug containers that they would use in subsequent semesters.

Table 1: Mathematical skills needed by nursing students and examples from nursing

<table>
<thead>
<tr>
<th>Mathematical skills needed</th>
<th>Examples from nursing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Arithmetic: decimals (especially powers of 10), and concepts; fractions (what they are); divisor dividend misunderstanding; cancelling fractions (especially multiple including mixed</td>
<td>(\frac{2500 \times 3}{25} ) (2500mg of drug required with 25 mg per 3 mL of the liquid to be given)</td>
</tr>
</tbody>
</table>
2. **Formulas:** using them and then related to skills in 1. above.

\[ BMI = \frac{W}{h^2} \]  
(BMI = body mass index; \(W\) = weight in grams; \(h\) = height in metres)

3. **Ratio and Proportion**

Essential in drug calculations

4. **Graphs and charts:** reading them carefully including units and scale (often related to 1. understanding decimals)

Patient charts; drug concentration over time

![Graph](image)

5. **Rates and Percentages:** (what to do with the 100); then related to 1. (cancelling; decimals and understanding fractions)

Intravenous infusions

You have to run an infusion of 500 ml Dextrose/Saline over the next 3 hrs. How many ml per hour will you be infusing at? How many drops per minutes will the infusion be set to if you are using a giving set of 20 drops/ml

Drugs in milligrams or grams; volumes of liquids in mLs or L.

6. **Measurement:** conversion; confusing volume (mL) and mass (mg) and then related to skill 1.

Drug calculations: reading the problem

The doctors have ordered an infusion of 1500 mL of 5% Dextrose to be given at the rate of 50 drops per minute. Assuming a drop factor of 20 drops per mL, how many hours will it take for this infusion to complete?

7. **Problem solving**

Student self-audit

As the curriculum is embedded in this nursing program, and recognition is made of variable student readiness for university, a mechanism for students to take different pathways was developed. It ensured those with the skills and the confidence to transfer these skills to the university nursing context didn’t have to spend time revising mathematics skills. It also allowed students to refresh their skills; and if they didn’t have the skills allowed students to develop them. Hence a self-test mechanism was developed to find out what was known by the student, and this was completed, marked and checked by the students themselves. A computer based student self-audit was developed based on the materials audit and included confidence levels. This self-audit approach has been used by the university in a number of other courses (Taylor, 1998; Taylor & Mander, 2003). An adaptation of this audit has been used since 2003 for
beginning nursing students and in 2007 was part of the students’ first assignment. The test was completed by the majority of students in the first tutorial and while they could use a calculator (either a hand held or a computer based one), students were encouraged to try without to test their skills. It was emphasized that it was not the mark in the test that counted but the attempt and the reflection. A completely online version of the test was then used as a final piece of assessment. It was not possible to get reliable pre-test data, but data from the previous 99-02 pre-test was available. The questions and results of the post test can be seen in Appendix A with a comparison with the mean pre 99-02 data. While conclusions from these data are problematic, it appears that there may be some improvement in aspects of students’ mathematics skills, particularly those marked with an asterisk. For example in question 22, in the past only 50% of students answered correctly, but in the post-test in 2007, 90% of students were correct. This is not to say nursing students will be numerate in practice and it is unclear if this improvement is long lasting. Further curriculum development in years 2 and 3 of the program would need to be investigated.

Some examples of students’ work from the initial self test are shown in Figures 1 and 2 which highlight some further issues for curriculum development.

- Some students were unable to discriminate the correctness of their answer, e.g. one student, in finding the amount of fluid in a syringe wrote 0.745 when the answer was 0.75 and thought her answer was wrong;
- Some students commented on the ease of the question (as well as ranking confidence) but were sometimes wrong. For example in converting 7 hrs 20 mins to minutes a student wrote:

  \[
  \begin{array}{r}
  60 \\
  \times 7 \\
  \hline \\
  590 + 20 \\
  \text{easy}
  \end{array}
  \]

- Some students got the answer correct, but were under-confident or made comments to that effect e.g.

  \[
  360 \div 1000 = .36 \quad \text{BAD}
  \]

- Some just made comments ‘I hate long division’
- Students didn’t always use the calculator (often they said they wanted to challenge themselves) but may have used it incorrectly when they did use it: e.g.

  \[
  \frac{3}{4} = ? \\
  x = \frac{4}{3} \times 15 \\
  = 19.999
  \]

In figure 1 the student had a correct strategy of using tables he/she knew (x 10) and then using repeated addition. Unfortunately there was an error (132 ÷ 12 = 144 +12 = 150). She also correctly changed the remainder 6 into a decimal (of 0.5). How she did this was not clear. Students are keen to not use calculators as they are uncertain whether their use is routine in the ward. While this issue is still unclear, students may need strategies to help them with situations where something like this may occur. Should a curriculum encourage students’ early deep knowledge of the relation between multiplication and division? As this test was completed almost without notice, it often captured students’ long term knowledge of number skills; it may be what nurses will use under pressure? It is interesting to note that this student was certain this particular answer was right (5 = complete confidence).
Figure 1: Student answer to a division question.

Figure 2 shows a student had a correct strategy and understood multiplication as repeated addition. While the exact understanding of decimal placement is not clear from the written form, it does appear that the student had knowledge of the make up of 500 and the associative law. Again how should this be addressed? Should there be strategies to multiply by numbers like 500 (e.g. multiply by 1000 and divide by 2)?

Figure 2: Student answer to a multiplication question in-context

At the moment while the course material doesn’t explicitly address these particular problems, it does provide video examples of friends using different strategies to divide a restaurant bill and a waitress multiplying by powers of ten by moving the decimal point, to find the total of a bill (from Taylor & Galligan, 2002).

Reflection

It is important to investigate why students don’t know certain concepts. Is it because they have forgotten, are anxious about it, get confused, have had missed schooling etc.? The third characteristic therefore, was to include a reflection mechanism to find out more about the student. The self-audit was linked to assessment where students included sections for reflection. For example if they had forgotten a particular concept then they would take a different strategy to revise than if they had learnt it but never understood. Samples of students’ reflective comments are included below.
Student AH: as a general rule I understand what the question is asking and I don’t know how to properly answer the question or I make silly mistakes in my working.

Student 89: Before attempting the questions I will read the questions thoroughly and if the answer does not look right I will attempt the question more than once until the question looks correct.

Student 94: I do agree with the study plan [the computer automatically generated a study plan], except for the volume concentrations, I do understand volume concentrations but I just read the scale wrong, whereas not knowing how to do it. I feel that I do not have to put a lot of time into the studying of the maths; I am one of those people that can be shown something once and will remember it for a while. I enjoy maths on a scale of 1 - 10 around 8. I enjoy maths as long as I can see the purpose for doing the maths, algebra I always struggled in due to I could not find a purpose for the equations and so on

In 2008 we incorporated a reflective and ‘strategies I will use’ components in each question to be completed in week 2 and then a similar components to be completed at the end of the semester to see if the students have shifted in their confidence, understanding, appreciation or approach to the mathematics needed in nursing

**Flexible**

In the 2007 evaluation there were some students who wanted more flexibility in how they approached the course. In 2008 some changes were made to provide a mechanism for them to self-select flexible curriculum alternatives. Students answered three questions in an online survey on completion of the skills test and reflection. (see Table 2). A parallel set of IT questions was also asked.

*Table 2: Students’ selection of approach to course*

<table>
<thead>
<tr>
<th></th>
<th>Totally agree (4)</th>
<th>Somewhat agree (3)</th>
<th>Not sure (2)</th>
<th>Disagree (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am competent in these maths skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident I will be able to use these maths skills in a nursing context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I understand the maths skills well</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All students benefit by reflecting on academic skills they need for a particular course/s. Some students refresh these skills, in context in the first 5 weeks of semester and then finish; some may aim for this and change, others will need the whole semester, still others will need extra support. Overall we have identified five different options:

- Option 1 would suggest that students could fast-track (score 11 or 12);
- Option 2 (score 9 or 10); that students could fast-track but may need to reflect a bit more on each section;
- Option 3 (score 7 or 8); students could consider normal track to boost confidence, to revise some skills with more scaffolding;
- Option 4 (score 5 or 6); students would normal track perhaps with extra support where needed and
- Option 5 (score 3 or 4); would normal track with extra support.
The reliability of this system will be tested in 2008, by tracking students’ completion rates, support used and attendance at tutorials and mapping this to the results of the selftest.

Content

Linked to the second characteristic of the student self-audit is a curriculum approach related to each type of student. If it is ‘already learned’ mathematics content knowledge, then students can quickly refresh in the new nursing context, so it is clear that the mathematics is important. For those whose mathematics skills are incomplete a different approach was needed. For these students addressing context and affect is vital. Moreover there needs to be an approach that assists the students to identify what they found difficult in the past. Thus the content would include that for simple revision; for development; for anxiety; and for overcoming barriers to understanding. In MAT1008, while the content may reflect some school mathematics, in an academic nursing setting it becomes highly relevant, highly contextualized, has rewards built in to boost students’ confidence, and content that has a variety of explanations and modes of delivery. In MAT1008, this took a number of forms: written material; visual material; pre-recorded teacher talk; interactive marking, peer marking etc. The content of the course is linked directly to the audit mentioned earlier, and the seven modules written reflect these skills in context. Figure 6 shows examples of features of the content.

Table 3: Features of content that attends to numeracy needs.

<table>
<thead>
<tr>
<th>Content:</th>
<th>Feature of course example</th>
</tr>
</thead>
</table>
| for simple revision | Selftest with worked solutions linked to other material if needed. **Final Results for student 123456789 for Readiness test**  
You need to study the following sections:  
SIMN 3.4 Divide by powers of 10  
SIMN 6.4 Volume concentrations  
SIMN 7.6 Average Rates  
TPPA 2.2.1 Addition  
TPPA 2.2.2 Subtraction  
TPPA 2.2.3 Multiplication  
TPPA 2.2.4 Multiplication  
TPPA 7.2 Rearranging equations  |
| for development | Optional examples and exercises with worked solutions;  
**Exercises**  
(a) Evaluate the following **without** a calculator.  
Check your results on the calculator.  
(i) \(7 \times 5 + 4\)  
(ii) \(10 - 6 \times 7\)  
**Solutions**  
(a)  
(i) \(7 \times 5 + 4\)  
\(= 35 + 4\)  
\(= 39\)  
(ii) \(10 - 6 \times 7\)  
\(= 10 - 42\)  
\(= -32\)  |
| for anxiety | • Early and late assessment for planning and reflection only;  
• quick response to assignments  
• videos of everyday numerate experiences linked to nursing numeracy;  
• peer marking – sample below (CMS assignment 1 moderation page) |
that overcomes barriers to understanding

- Extra support through a university academic skills unit;
- Pre-recorded teacher talk going over how to do certain skills

that is highly relevant and contextualised

- ALL skills related to nursing and to their other courses e.g. using:
  - SI units and measurement in Biophysical Nursing Foundations;
  - reading graphs in Social Determinants of Health;
  - includes videos and photos related to nursing
Exercise 10.2.1 Look carefully at the syringes below and read, as accurately as you can, the volume of fluid contained in them. Note the syringes have cc as units (i.e. cubic centimeters). One cc = 1mL.

| which has rewards built in to boost confidence | • Early assessment that doesn’t penalise not remembering the maths;  
| | • flexible online testing |
| with variety of explanations | • Written;  
| | • teacher talk recorded;  
| | • visual material added |

**Delivery**

Finally, the delivery needs to be considered. At USQ the approach to develop academic skills in nursing, is through courses for credit. However in many universities, numeracy support staff do not often get this chance and numeracy is not usually directly taught by a face-to-face lecturer (as it is assumed knowledge). Moreover today's students approach studying at university very differently from 20 years ago (Lawrence, 2005) Students often do not attend lectures and tutorials due to work and family commitments. Delivery needs to be flexible and has to be developed within a current curriculum, scaffolded without the lecturer, but have a mechanism where students may elect to access extra support.

There is strong move to more computer mediated environments, thus the ability to incorporate alternative avenues for students to follow is becoming easier to develop. The material in this course was prepared to be delivered in multi-modal format and had particular characteristics to suit the learner. This included:

- Cartoons for humour;
- Social presence in the online format so students could get feedback from tutors and fellow students;
- Videos of a nursing practitioner explaining the importance of each mathematics concept;
- Video clips of adults (re) learning various maths concepts (mainly from module 1) in the context of everyday life;
- Pictures of drug labels for authenticity;
- Extra material to explain concepts in more detail if needed with fully worked solutions.

**Discussion**

The evaluation data received to date suggest that our approach assists students to develop nursing attributes. The instant nature of most of the assessments also had a direct impact on our teaching, allowing the course team to respond to student queries and to trouble shoot more effectively. The feedback from 2007 suggests that students are extremely supportive of the courses. The pre and post tests in mathematics and pre and post reflective comments by students are evidence of increased confidence and competence in numeracy, as well as IT, academic,
research and communication skills. Teamwork, study and reflective and evidence-building capabilities related to university and discipline requirements were also favourably mentioned in the feedback.

The management systems assisted the CMS/MAT team’s effectiveness in achieving our goals. The content and authoring management system, for example, allowed the authors to easily incorporate multi-media features to support learning addressing anxiety, flexibility of learning, contextualizing learning and allowing for variety of explanations. The learning management system was highly praised by the students as being easy to use and helped students to connect with their assessments, material, fellow students and the instructors.

The success of the course relies on the six characteristics detailed in the paper. The academic numeracy audit, while not necessarily producing new insights into the mathematics skills needed, provided direct links to expert academic nursing staff and most appropriate in-context examples. For example USQ students are in a rural area and rural nursing issues are important, so graphs and statistics linking to this context were used. The student self-audit and reflections move away from the unhelpful remedial approach to diagnosing skills. The flexible approach to curriculum, student readiness and delivery provide students with maximum opportunity for learning. We realise this approach to building nursing professional attributes is only one step. The next is to map the development of numeracy over three years of the degree and into their profession. This will allow the students to develop their competence and confidence in numeracy to prepare for the demands of nursing.

References


# Appendix A

<table>
<thead>
<tr>
<th>Question</th>
<th>% correct</th>
<th>Post 07</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Write the following number in numerals: <em>Twenty thousand two hundred and six</em></td>
<td>87</td>
<td>77</td>
</tr>
<tr>
<td>2. [ 102 - 36 = ]</td>
<td>95</td>
<td>98</td>
</tr>
<tr>
<td>3. [ 1048 + 21376 = ]</td>
<td>94</td>
<td>96</td>
</tr>
<tr>
<td>4. [ 23 \times 145 = ]</td>
<td>87</td>
<td>96</td>
</tr>
<tr>
<td>5. [ 168 \div 12 ]</td>
<td>95</td>
<td>98</td>
</tr>
<tr>
<td>6. Estimate [ 512 \times 174 ]</td>
<td>36</td>
<td>57*</td>
</tr>
<tr>
<td>7. Round 495 to the nearest 10</td>
<td>88</td>
<td>89</td>
</tr>
<tr>
<td>8. [ 7 + 2 \times 3 = ]</td>
<td>58</td>
<td>83*</td>
</tr>
<tr>
<td>9. [ 3/4 = 15? ]</td>
<td>93</td>
<td>96</td>
</tr>
<tr>
<td>10. Find the average (mean) of the following list of numbers: 21.3, 22, 24.7, 20.4, 19.</td>
<td>78</td>
<td>62**</td>
</tr>
<tr>
<td>11. 15.8 x 0.2</td>
<td>76</td>
<td>71</td>
</tr>
<tr>
<td>12. Express [ 3/4 ] as a decimal</td>
<td>93</td>
<td>86</td>
</tr>
<tr>
<td>13. Express [ 80/480 ] as a fraction in simplest form</td>
<td>80</td>
<td>90*</td>
</tr>
<tr>
<td>14. [ 7.42 \div 100 ]</td>
<td>88</td>
<td>97</td>
</tr>
<tr>
<td>15. Find 30% of 25.</td>
<td>83</td>
<td>92</td>
</tr>
<tr>
<td>16. Express 0.5 as a fraction in simplest form</td>
<td>90</td>
<td>96</td>
</tr>
<tr>
<td>17. Calculate: [ 2 \text{mL} - 1.34 \text{mL} ]</td>
<td>91</td>
<td>98</td>
</tr>
<tr>
<td>18. Calculate: [ \sqrt{81} ]</td>
<td>93</td>
<td>95</td>
</tr>
<tr>
<td>19. Express 7 hours 20 minutes in minutes</td>
<td>93</td>
<td>95</td>
</tr>
<tr>
<td>20. Express 1.2 hours in minutes</td>
<td>50</td>
<td>79*</td>
</tr>
<tr>
<td>21. [ 360 \text{mL} = ?L ]</td>
<td>86</td>
<td>81</td>
</tr>
<tr>
<td>22. [ 1.23 \text{g} = ?mg ]</td>
<td>50</td>
<td>92*</td>
</tr>
<tr>
<td>23. The chart represents a patient’s temp. When was his temperature the highest?</td>
<td>Not asked</td>
<td>94</td>
</tr>
<tr>
<td>What was his temperature the last time it was taken?</td>
<td>Not asked</td>
<td>91</td>
</tr>
<tr>
<td>24. If [ h = \frac{w}{b} ] find ( b ) if ( w = 2 ), and ( h = 4 ).</td>
<td>Not asked</td>
<td>72</td>
</tr>
<tr>
<td>25. [ \frac{10}{4} = \frac{8}{x} ]</td>
<td>35</td>
<td>72*</td>
</tr>
<tr>
<td>26. The diagram represents a syringe with fluid. How much fluid is in the syringe?</td>
<td>48</td>
<td>81*</td>
</tr>
<tr>
<td>27. Energy is measured in Kilojoules (kJ). Margarine contains 32.2 kJ/gram. How much energy is in 500g tub of margarine?</td>
<td>83</td>
<td>86</td>
</tr>
<tr>
<td>28. A clock gains 15 seconds in a day. How long does it take to gain 2 minutes?</td>
<td>78</td>
<td>84</td>
</tr>
<tr>
<td>29. A Paediatric patient weighing 25 kg is ordered Augmentin 10mg/kg. If Augmentin is supplied as a syrup containing 125mg/mL, how much syrup is to be measured out</td>
<td>68</td>
<td>86</td>
</tr>
</tbody>
</table>