Year 7 Term 1 Homework

Student Name: _____	**Grade**: _____
Date: _____	**Score**: _____

Table of contents

This edition was printed on January 13, 2012.

Camera ready copy was prepared with the **LaTeX2e** typesetting system.

8 Year 7 Term 1 Week 8 Homework

8.1 Square and cube roots

Exercise 8.1.1 Evaluate each of these.

1. $\sqrt{17+19}$
2. $\sqrt[3]{2+5^2}$
3. $\sqrt{2\times 50}$
4. $\sqrt[3]{5^2+10^2}$
5. $\sqrt[3]{2^2\times 3^3\times 2}$
6. $\sqrt[3]{1000}\div\sqrt{25}$
7. $2^4+\sqrt{144}-\sqrt{16}$
8. $\sqrt{121}-\sqrt[3]{27}\times 2$
9. $\sqrt{49}+\sqrt[3]{125}$
10. $\sqrt{64}-\sqrt[3]{64}$

Exercise 8.1.2 Use the order of operations to evaluate the following:

1. $4+\sqrt{16}\times 4$
2. $\sqrt[3]{27}\times 3+12\div\sqrt{9}$
3. $\sqrt{121}-\sqrt[3]{125}\times 2$
4. $\sqrt{64}\times\sqrt[3]{1000}\div\sqrt{25}$
5. $\sqrt{25}+\sqrt{256}-\sqrt[3]{64}$
6. $\sqrt{144}\div 6+3^4$

8.2 Chapter Review

1. Write down the following numbers using digits 2, 3, 4, 5 and 8 once only in each number:

   (a) largest three-digit even number _____

   (b) smallest three-digit odd number _____

   (c) largest four-digit odd number _____

   (d) smallest four-digit even number _____

2. State which of these numbers are palindromes.

   (a) 24342 _____

   (b) 12512 _____

   (c) 46446 _____

   (d) 8008 _____

   (e) 123321 _____

3. What is the only digit that cannot be found in the units place of a palindromic number? _____

4. What is the second largest factor of 242? _____

5. List the first 8 square numbers that are even numbers.

   _____

   _____

6. Find the 15th square number. _____

7. Write down the first square number that is greater than 100. _____

8. State the first three triangular numbers that contain the digit 2. _____

9. List the first twelve Fibonacci numbers:

   _____

   _____

10. By how much does the sum of the first nine Fibonacci numbers exceed the sum of the first six?

    _____

    _____

11. Find the two triangular numbers whose product is 63.

12. Find the 9th multiple of 6.

13. Which multiple of 8 is 72?

14. If 1304 is a multiple of 8, find the next 4 multiples of 8.

15. Find all factors of each number:

    (a) 32

    (b) 84

    (c) 72

16. Find the LCM of:

    (a) 64 and 24

    (b) 18 and 12

    (c) 24, 36 and 48

17. Find the HCF of:

    (a) 15 and 45

    (b) 21 and 28

    (c) 32, 40 and 84

18. State whether these numbers are prime or composite:

    (a) 23

    (b) 39

    (c) 47

    (d) 91

19. Use the divisibility tests to determine whether 87 is prime or composite.

20. Express each of these numbers as the sum of two primes:

    (a) 16

    (b) 24

    (c) 36

    (d) 40

21. What are twin primes?

22. List the first three pairs of twin primes.

23. Find the first 2-digit prime with 9 in tens place.

24. What is the next odd composite number after 11?

25. Draw a factor tree and use it to express each number as the product of its prime factors. Give your answers in index form.

    (a) 36

    (b) 64

    (c) 156

    (d) 1936

26. Use the given prime factors to find the HCF of each pair of numbers.

    (a) If $441 = 3 \times 3 \times 7 \times 7$ and $1134 = 2 \times 3 \times 3 \times 3 \times 3 \times 7$, what is the HCF (441, 1134)?

    (b) If $3575 = 5 \times 5 \times 11 \times 13$ and $23595 = 3 \times 5 \times 11 \times 11 \times 13$, what is the HCF (3575, 23595)?

27. Use the given prime factors to find the LCM of each pair of numbers:

    (a) If $24 = 2 \times 2 \times 2 \times 3$ and $42 = \times 2 \times 3 \times 7$, what is the LCM (24, 42)?

    (b) If $392 = 2 \times 2 \times 2 \times 7$ and $350 = 2 \times 5 \times 5 \times 7$, what is the LCM (392, 350)?

28. Evaluate:

    (a) $\sqrt{64} \times \sqrt[3]{125}$

    (b) $\sqrt[3]{2^3 + 19}$

    (c) $\sqrt{4 \times 25} \div 5$

    (d) $\sqrt{49} + \sqrt[3]{64}$

29. Find the value of $\sqrt[3]{42875}$ if $42875 = 5 \times 5 \times 5 \times 7 \times 7 \times 7$.

30. Find the value of $\sqrt{576}$ if $576 = 16 \times 36$.

8.3 Problem Solving — Percentages

1. The cost of a pen is 70% the cost of a book. The book costs \$12 more than the pen.

   (a) Find the cost of a pen.

   (b) Find the total cost of 2 pens and 2 books.

2. The cost of 1 kg of pork is 60% the cost of 1 kg of beef. A kg of beef costs \$2.30 more than a kg of pork.

   (a) Find the cost of 1 kg of beef.

   (b) Find the total cost of 3 kg of pork and 4 kg of beef.

3. Last year, William had 1000 stamps. 16% of these stamps were from China. This year he has been given some more Chinese stamps. As a result the percentage of William's stamps which were from China increased to 30%. How many stamps had William been given?

4. A few minutes ago, 40% of the 240 children in a school hall were girls. Some more children entered the hall and the number of boys increased by 50%. Now 80% of the children in the hall are girls. How many girls had just entered the school hall?

8.4 Miscellaneous Exercise

Exercise 8.4.1

1. *Express the extended fraction* $1 + \frac{1}{1+\frac{1}{1+\frac{1}{3}}}$ *as a simple fraction in lowest terms.*

2. *Find the least whole number N greater than 40 for which N divided by 4 leaves a remainder of 1 and N divided by 5 leaves a remainder of 3.*

3. *Solve each of the following equations:*

   - $4x - 9 = 15$
   - $5(x - 1) + 2(x - 1) = 14$
   - $3(2 - 4x) = 4(2x + 1)$
   - $5x - 3 = 2(x - 3) - 18$

8.5 Math Challenge

Exercise 8.5.1

1. *The product of 45 and the counting number N is a perfect cube. Find the least possible value of N (e.g.* $3^3 = 27$, $4^3 = 64$*).*

2. *How many whole numbers between 1 and 170 have exactly three different factors? (e.g. 4 has 3 factors: 1, 2 and 4)*

3. *The average of all five of David's marks is exactly 86. The average of his first three marks is exactly 82. What is the average of his last two marks?*

4. *Suppose P and Q both represent prime numbers. If* $5 \times P + 7 \times Q = 109$*, what is the value of the prime P?*

5. *Two identical squares with sides of length 4 cm overlap to form a shaded region as shown below. A corner of one square lies at the intersection of the diagonals of the other square. Find the area of the whole figure.*