

Algebra

Non-negotiable

1.1 Solve for x : $\frac{2x+1}{5} - x \leq \frac{1}{2}(3x-4) + 3$ (5)

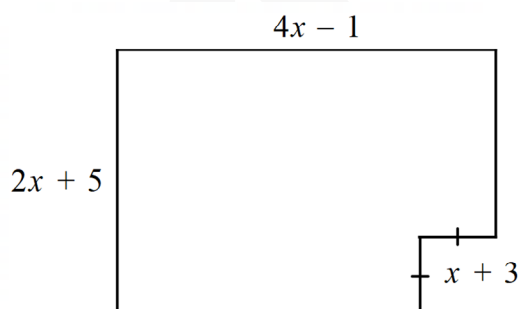
1.2 Solve for x and y : $x - 4y = 12$ and $3x + 2y = 8$ (4)



Take it up a notch

2.1 Simplify $\frac{8x^3 - 1}{2x^2 + 5x - 3} \div \frac{8x^3 + 4x^2 + 2x}{8x^3 + 24x^2}$ (6)

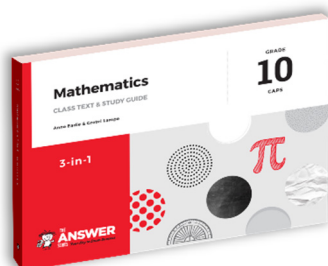
2.2 Determine the value of x if the area of the shape below is 146 units².



(6)

Reach for the stars

3. Given $9^w = 11$; $11^x = 15$; $15^y = 22$; $22^z = 27$. Determine the value of $wxyz$ without the use of a calculator. (5)



For more examples see page 1.1.
to 1.7 and 2.1 to 4.27 in the
Grade 10 Maths 3-in-1 Study Guide

Patterns

Non-negotiable

1. Given: 2; 8; 14; 20; 26; ...
 - 1.1 Write down the next term of the pattern. (1)
 - 1.2 Determine the n th term of the pattern. (2)
 - 1.3 Write down the 100th term. (2)
 - 1.4 Which term is equal to 278? (2)



Take it up a notch

2. The pattern below consists of grey and white squares. Only consider unit squares in this example.

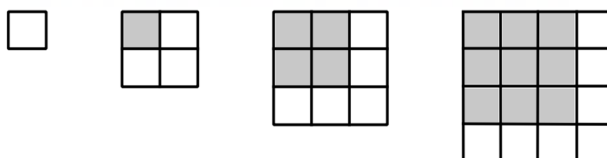


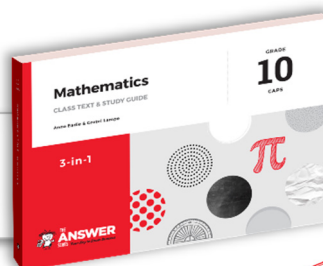
Fig. 1 Fig. 2 Fig. 3 Fig. 4

- 2.1 Write down the number of grey squares in the 15th figure. (1)
- 2.2 Determine the number of white squares in the 15th figure. (2)
- 2.3 Determine the number of grey squares that are in the figure that has 379 white squares. (4)
- 2.4 Two consecutive figures have a TOTAL number of 10 805 squares. Determine which two figures these are. (5)

Reach for the stars

3. Given: $1^2 + 2^2 = 3^2 - 2^2$ Row 1
 $2^2 + 3^2 = 7^2 - 6^2$ Row 2
 $3^2 + 4^2 = 13^2 - 12^2$ Row 3
 - 3.1 Write down row 4. (1)
 - 3.2 Write down row n . (2)
 - 3.3 Prove algebraically that row n is true. (4)

For more examples see
page 1.7 to 1.16 in the
Grade 10 Maths 3-in-1 Study Guide



Functions

Non-negotiable



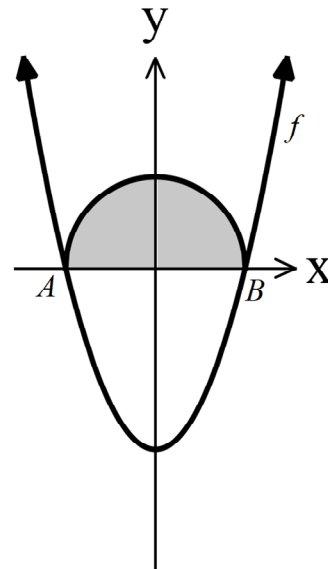
1. Given $p(x) = -\frac{2}{x} + 2$ and $q(x) = -x + 3$.
- 1.1 Draw the graphs of p and q on the same set of axes. Show all important information. (5)
- 1.2 Write down the range of p . (2)
- 1.3 Write down the equation of the axis of symmetry of p that has a positive gradient. (2)
- 1.4 For what value(s) of x is:
- 1.4.1 $p(x) = q(x)$? (5)
- 1.4.2 $p(x) > 0$? (2)
- 1.4.3 $p(x) \geq q(x)$? (3)

Take it up a notch

2. $f(x) = ax^2 + c$ is drawn passing through $(2; -6)$ and $(-8; 24)$.

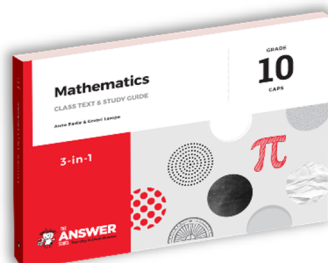
A semi-circle is drawn with AB as the diameter.

- 2.1 Determine the equation of $f(x)$. (4)
- 2.2 Hence determine the area of the semi-circle, correct to two decimal places. (4)



Reach for the stars

3. The function $y = f(x)$ is a straight line. $f(0) = 5$ and $f(f(0)) = -5$. Determine $f(f(f(0)))$. (5)



For more examples see page 6.1 to 6.26 in the **Grade 10 Maths 3-in-1 Study**

Finance

Non-negotiable

1. An amount of R5 000 is invested in an account at 5,6% p.a. compounded quarterly. Determine the total amount in the account after six years. (3)

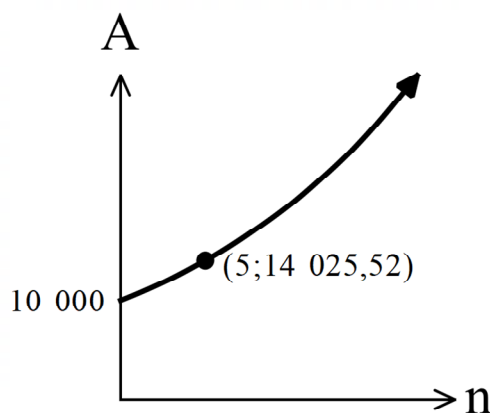


Take it up a notch

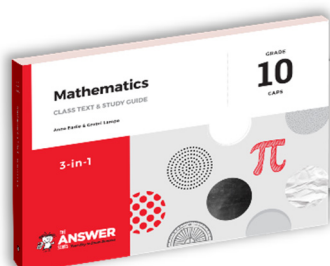
2. R7 000 is invested at 8% p.a. compounded quarterly for two years. The interest rate then changes to $x\%$ p.a. compounded monthly for four years. You are hoping to have at least R12 000 in the account after the six years. Determine, correct to two decimal places, the smallest value of x that will result in this. (5)

Reach for the stars

3. A certain amount of money is invested in an account offering compound interest. The graph below represents the formula $A = P(1+i)^n$. The points $(0;10\ 000)$ and $(5;14\ 025,52)$ lie on the graph.



- Determine the value of i correct to the nearest integer. (5)



For more examples see page 9.1 to 9.11 in the **Grade 10 Maths 3-in-1 Study Guide**

Probability

Non-negotiable

1. There are 75 learners in Grade 10 at a particular school. 25 of them like working in the library before school, 30 of them like working in the library after school, and 30 never go into the library.
 - 1.1 Use a Venn diagram to determine the number of learners who work in the library both before and after school. (4)
 - 1.2 Determine the probability that a learner only works in the library after school. (2)

Take it up a notch

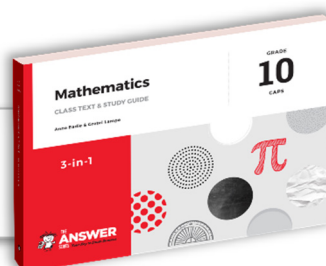
2. Use a new Venn diagram for each question and shade the required area.
 - 2.1 $P(A \text{ and } B)$ (2)
 - 2.2 $P(A \text{ or } B)$ (2)
 - 2.3 $P(A' \text{ and } B)$ (2)
 - 2.4 $P(A \text{ or } B')$ (2)
 - 2.5 $P(A \text{ and } B)'$ (2)
 - 2.6 $P(A' \text{ and } B')$ (2)



Reach for the stars

3. Given:
 - $P(A \text{ and } B) = 0,2$
 - $P(A \text{ or } B)' = 0,28$
 - $P(B) = 3P(A)$Determine $P(B \text{ and } A')$. (5)

For more examples see
page 12.1 to 12.14 in the
Grade 10 Maths 3-in-1 Study Guide



Data Handling

Non-negotiable

1. The following marks were obtained by a class of Grade 10 learners on a test out of 50 marks.

Marks	Frequency
$0 < x \leq 10$	2
$10 < x \leq 20$	7
$20 < x \leq 30$	13
$30 < x \leq 40$	8
$40 < x \leq 50$	5

- 1.1 Determine the approximate mean of the data. (4)
1.2 Write down the modal class. (1)
1.3 What percentage of the class achieved more than 80%? Give your answer to the nearest percentage. (2)

Take it up a notch

2. Eight numbers are written in ascending order.

17; 20; 21; 27; x ; 32; 36; 39

Determine the value of x , if the mean and the median of all eight numbers is the same. (5)

Reach for the stars

3. The following stem and leaf diagram is given.

6	0 2 2
10	1 3 3 3
14	0 2 2 3 3
18	0 2 3 3 3 3
22	3 3 3 3
26	0 0 2
30	1 2

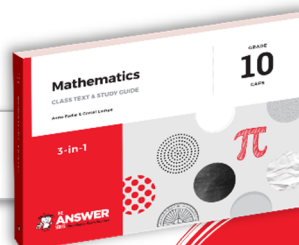
This is a very unusual way of asking this – look at the key carefully!



Key 6 | 2 means $6 + 2 = 8$

- 3.1 Determine the five number summary for the data. (4)
3.2 Draw a box and whisker diagram for the data. (3)

For further examples, see pages 10.1 to 10.15 in the
Grade 10 Maths 3-in-1 Study Guide



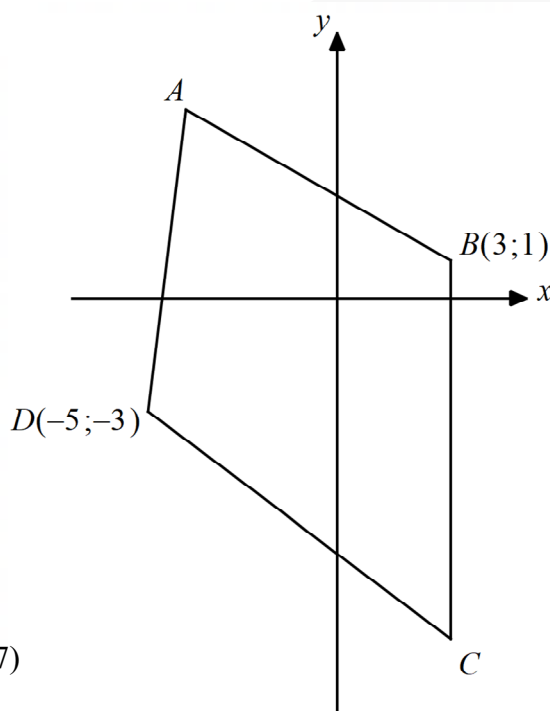
Analytical Geometry

Non-negotiable

1. Given: $A(-3;4)$ and $B(1;-6)$
 - 1.1 Determine the length of AB in surd form. (2)
 - 1.2 Determine the midpoint of AB. (2)
 - 1.3 Determine the gradient of AB. (2)
 - 1.4 Determine the equation of AB. (2)

Take it up a notch

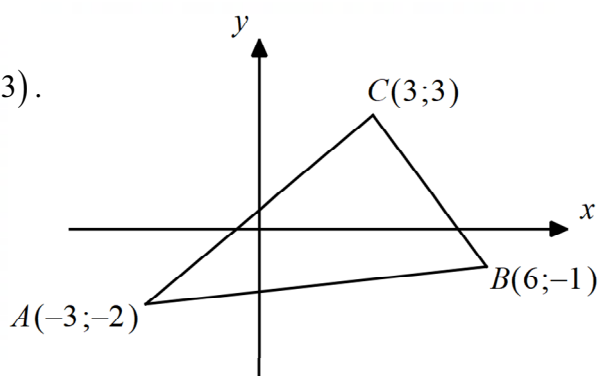
2. ABCD is a kite with $B(3;1)$ and $D(-5;-3)$.



Determine the equation of the line passing through A and C . (7)

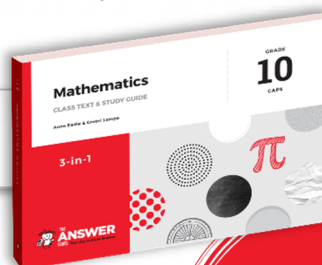
Reach for the stars

3. Given $A(-3;-2)$, $B(6;-1)$ and $C(3;3)$.



Determine the area of $\triangle ABC$. (5)

For further examples, see pages 8.1 to 8.13 in the **Grade 10 Maths 3-in-1 Study Guide**



Trigonometry

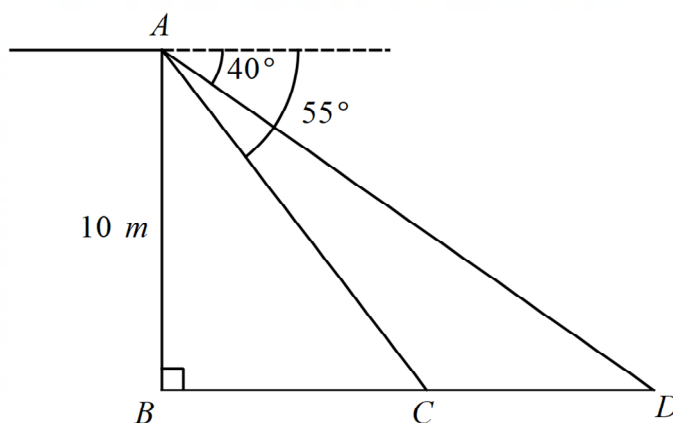
Non-negotiable

Calculators may not be used in this question.

- 1.1 If $13 \cos \theta + 5 = 0$ and $180^\circ < \theta < 360^\circ$, determine the value of $12 \operatorname{cosec} \theta - 10 \tan \theta$. (6)
- 1.2 Determine the value of $\operatorname{cosec} 60^\circ \cot 30^\circ + \cos 45^\circ \operatorname{cosec} 45^\circ$. (5)

Take it up a notch

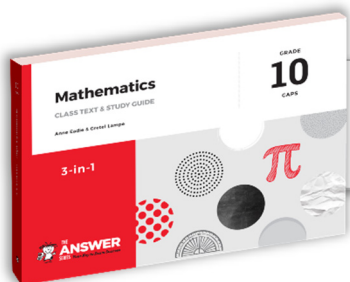
2. A person stands at the top of a 10 metre building and observes a man standing at point D and a dog at point C. The angle of depression to the man is 40° and to the dog is 55° .



Determine the distance from the man to the dog, i.e. DC, correct to two decimal places. (5)

Reach for the stars

3. $\sin A = \frac{2x}{x^2 + 1}$ and A and B are complementary. Determine $\tan B$ in terms of x . (5)

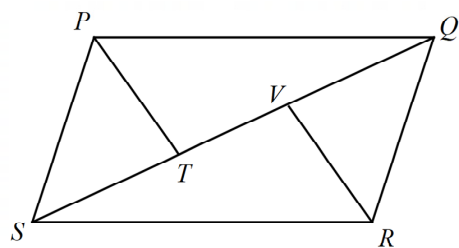


For further examples, see pages 5.1 to 5.27; 6.16 and 6.17 in the **Grade 10 Maths 3-in-1 Study Guide**

Euclidean Geometry & Measurement

Non-negotiable

1. PQRS is a parallelogram.
PT bisects \widehat{QPS} and RV bisects \widehat{QRS} .

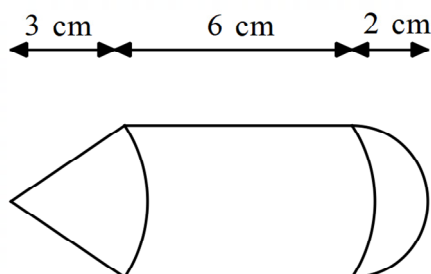


1.1 Prove that $\triangle PTS \cong \triangle RVQ$. (5)

1.2 Hence prove that PVRT is a parallelogram. (4)

Take it up a notch

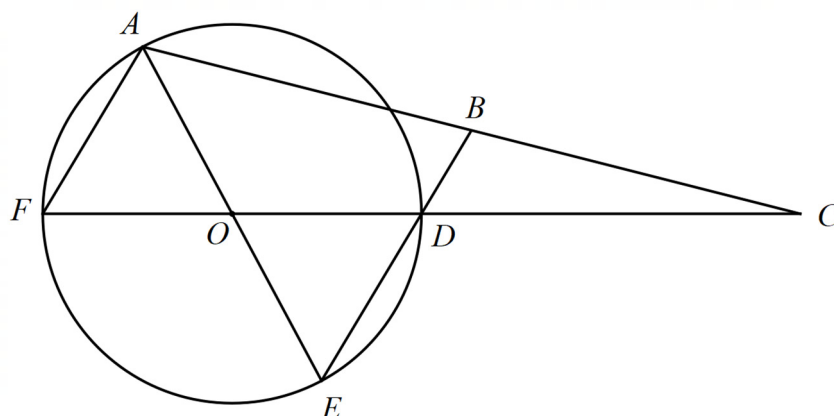
2. A cone is placed on a cylinder, which is placed on a hemisphere.



Determine the volume of the combined shape, correct to two decimal places. (7)

Reach for the stars

3. A circle, centre O, passes through A, D, E and F. FD produced and AB produced meet at C. $FD = DC$.



Determine $ED : DB$. (7)

For further examples, see pages 7.1 to 7.22 and 11.1 to 11.11 in the **Grade 10 Maths 3-in-1 Study Guide**

