

# Year 9 maths revision essay



**ASSIGN  
BUSTER**

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**BackChecking** This means that you will be doing every step of the question twice, as you work your way through the question to ensure no silly mistakes. For example with this question:  $3 \times 2 + 5 \times 7$  you would do “  $3 \times 2$  is  $6$  ... let me check – no  $3 \times 2$  is  $6$  ...  $5 \times 7$  is  $35$  ... let me check ...  $6 + 35$  is  $41$ . Initially, this may seem timeconsuming, but once it is automatic, a great deal of time and marks will be saved. **Avoid Cosmetic Surgery** Do not write over old answers since this often results in repeated mistakes or actually erasing the correct answer.

When you make mistakes just put one line through the mistake rather than scribbling it out. This helps reduce silly mistakes and makes your work look cleaner and easier to backcheck. **Pen to Paper** It is always wise to write things down as you work your way through a problem, in order to keep track of good ideas and to see concepts on paper instead of in your head. This makes it easier to work out the next step in the problem. Harder maths problems cannot be solved in your head alone – put your ideas on paper as soon as you have them – always! **Transfer Skills** This strategy is more advanced.

It is the skill of making up a simpler question and then transferring those ideas to a more complex question with which you are having difficulty. For example if you can't remember how to do long addition because you can't recall exactly how to carry the one: to calculate that also involve carrying the one: ? This skill is particularly useful when you can't remember a basic arithmetic or algebraic rule, most of the time you should be able to work it out by creating a simpler version of the question. then you may want to try adding numbers which you do know how ?? ? ???? ??? ©2009 Ezy Math

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Skills These are the skills that keep a question together as an organized whole in terms of your working out on paper. An example of this is using the “=” sign correctly to keep a question lined up properly. In numerical calculations format skills help you to align the numbers correctly. This skill is important because the correct working out will help you avoid careless mistakes. When your work is jumbled up all over the page it is hard for you to make sense of what belongs with what.

Your “silly” mistakes would increase. Format skills also make it a lot easier for you to check over your work and to notice/correct any mistakes. Every topic in math has a way of being written with correct formatting. You will be surprised how much smoother mathematics will be once you learn this skill. Whenever you are unsure you should always ask your tutor or teacher. It's Ok To Be Wrong Mathematics is in many ways more of a skill than just knowledge. The main skill is problem solving and the only way this can be learned is by thinking hard and making mistakes on the way.

As you gain confidence you will naturally worry less about making the mistakes and more about learning from them. Risk trying to solve problems that you are unsure of, this will improve your skill more than anything else. It's ok to be wrong – it is NOT ok to not try. Avoid Rule Dependency Rules are secondary tools; common sense and logic are primary tools for problem solving and mathematics in general. Ultimately you must understand Why rules work the way they do. Without this you are likely to struggle with tricky problem solving and worded questions. Always rely on your logic and common sense first and on rules second, always ask Why?

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Self Questioning This is what strong problem solvers do naturally when they get stuck on a problem or don't know what to do. Ask yourself these questions. They will help to jolt your thinking process; consider just one question at a time and Talk Aloud while putting Pen To Paper. ©2009 Ezy Math Tutoring | All Rights Reserved 2 www. ezymathtutoring. com. au Table of Contents CHAPTER 1: Number Exercise 1: Indices Exercise 2: Scientific Notation & Significant Figures Exercise 3: Consumer Arithmetic CHAPTER 2: Chance & Data Exercise 1: Simple Probability Exercise 2: Data Representation & Analysis 3 9 12 15 20 25 31

CHAPTER 3: Algebraic Expressions Exercise 1: Simplifying Expressions Using Index Laws Exercise 2: Expressions Involving Fractions Exercise 3: Solving Equations Exercise 4: Fractional & Negative Indices Exercise 5: Expanding & Factorizing 35 41 44 47 50 53 CHAPTER 4: Coordinate Geometry Exercise 1: Determining Midpoint, Length & Gradient Exercise 2: Graphing Linear Relationships Exercise 3: Gradient/Intercept Form of Linear Equations 56 61 66 68 CHAPTER 5: Measurement Exercise 1: Area & Perimeter Exercise 2: Volume & Surface Area Exercise 3: Trigonometry 74 81 88 92

CHAPTER 6: Space Exercise 1: Properties of Polygons 100 104 ©2009 Ezy Math Tutoring | All Rights Reserved 3 www. ezymathtutoring. com. au Year 9 Mathematics Number ©2009 Ezy Math Tutoring | All Rights Reserved 4 www. ezymathtutoring. com. au Useful formulae and hints  $2^? \times 2^? = 2^{??}$  Index laws of multiplication and division are valid for the same base  $2^? \times 3^?$  cannot be simplified since the bases are different  $6^? = (3 \times 2)^? = 3^? \times 2^?$   $2^{??} = 1$  Different bases can be used if they are both raised to the same power If a number has a negative power, it can be converted to a positive power  $2^? = 1$

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$2^0 = 1$  Any number to the power zero is 1  $23134577^0 = 1$  Any number to the power 1 is itself  $234876^1 = 234876$  ...  $10^0 = 1$  A number is in scientific notation when it is on the form: Write it in the form  $a \times 10^n$  (that is one digit then the decimal point) To convert a number to scientific notation ©2009 Ezy Math Tutoring | All Rights Reserved 5 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) Count how many places you would have to move the decimal point to get back to the original number; to the left is negative, to the right is positive. This number is the power of 10  $3125 = 3.125 \times 10^4$  Example  $0.24376 = 2.4376 \times 10^{-1}$

Significant figures are the number of digits from the left of a number Zeroes are only counted as significant when they surround non-zero digits; in other cases they are just used to keep the other digits in their correct place value. The digits are rounded to the nearest whole number Example 52347 To one significant figure is 50000 To two significant figures is 52000 To three significant figures is 52300 To four significant figures is 52350  $0.004367$  To one significant figure is  $0.004000$  (the first zeroes are not significant  $0.004062$

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To 3 significant figures is  $0.00406$  (the 0 between the 4 and the 6 is significant)  $(0.0312 \times 10^2)$   $(48.7 \times 10^2)$   $(3.12 \times 10^2)$   $(4.87 \times 10^2)$   $(3 \times 10^2)$   $(5 \times 10^2)$   $15 \times 10^2$  Estimating products by using index laws and rounding example: There are 52 weeks, or 26 fortnights, or 12 months, or 365 days in a year (assuming not a leap year) Salary is an amount that is paid to a person regardless of the hours they work Taxation and other deductions are amounts taken from peoples' wages

and paid to the government to help fund such things as education, roads, hospitals etc.

They are usually taken as a percentage of one's pay Example: 8% tax on \$35000 =  $0.08 \times 35000 = \$2800$  Simple interest = Principal  $\times$  rate (per annum, expressed as a fraction)  $\times$  time  $20000 \times 0.04 \times 5 = \$4000$

Example: Interest on a principal of \$20000 at an interest rate of 4% If interest is not per annum, convert it first. For example, 3% per six months = 6% per annum

©2009 Ezy Math Tutoring | All Rights Reserved 7 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) To calculate discount of a price, express the percent discount as a fraction and multiply the price by this fraction Example: 5% discount on \$200 =  $0.05 \times 200 = \$10$

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Chapter 1: Number Exercise 1: Indices Exercise 1 Indices ©2009 Ezy Math Tutoring | All Rights Reserved 9 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) Chapter 1:

Number Exercise 1: Indices 1) Evaluate the following a)  $2^2$  b)  $3^2$  c)  $1^2$  d)  $4^2$

2) Express the following as powers of 2 4) Evaluate the following a)  $2^{2^2}$  b)

$3^{2^2}$  c)  $2^{2^2}$  d)  $4^{2^2}$  5) Evaluate the following a)  $2^2 \times 2^2$  b)  $3^2 \times 3^2$  c)  $4^2 \times 4^2$  e)

$2^{2^2}$  e)  $5^2$  a) 16 b) 2 c) 1 d) 64 e) 32 3) Express the following as powers of 3

d)  $3^2 \times 3^2$  6) Evaluate the following a)  $2^2 \times 2^{2^2}$  b)  $3^{2^2} \times 3^2$  d)  $4^{2^2} \times 4^2$  e)  $5^2 \times$

$5^2$  a) 9 b) 81 c) 3 d) 27 e) 1 ©2009 Ezy Math Tutoring | All Rights Reserved

c)  $2^{2^2} \times 2^{2^2}$  e)  $13^2 \times 13^{2^2}$  10 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) Chapter 1:

Number 7) Evaluate the following a)  $3^2 \times 3^2$  c)  $4^2 \times 4^2$  b)  $2^{2^2} \times 2^2$  d)  $10^2 \times$

$10^2$  8) Evaluate the following a)  $3^2 + 2^2$  b)  $5^2$  c)  $3^2 \times 2^2$  e)  $1^{2^2} \times 1^2$  c)

$(2^2 \times 2^2) \times 2^2 = 2^2 \times 2^2$  Exercise 1: Indices 10) Find the values of  $a$  and  $b$  in

the following  $2^a = 8^b = 2^{2^2}$  d)  $(2^2 \times 2^2) \times 2^2 = (2 + 2)^2$  d)  $(3^2 \times 2)^2$  e)  $4^2 + 5^2$  f)

9) From your answers to question 8, which of the following statements are true and which are false?

a)  $(a + b) + c = a + (b + c)$  b)  $(a + b) + c = a + b + c$

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Chapter 1: Number Exercise 2: Scientific Notation & Significant Figures

1) Express the following in scientific notation d) 0.000523123 e) 0.0554 f) 6.5121

4) Convert the following to decimal form a) 3125 b) 1000 c) 14250 d) 105000 e) 775 f) 7777

2) Convert the following to decimal form a)  $3.452 \times 10^{??}$  c)  $7. \times 10^{??}$  b)  $2.6552 \times 10^{??}$  d)  $1.423 \times 10^{??}$  a)  $3.233 \times 10^?$  c)  $7.06 \times 10^?$  b)  $4.1002 \times 10^?$  d)  $5.007 \times 10^?$

5) Use your knowledge of index laws and scientific notation to estimate the following products (see example at beginning of chapter) a)  $(3.15 \times 10^3) \times (5.22 \times 10^4)$  b)  $(4.85 \times 10^2) \times (6.33 \times 10^5)$  c)  $(2.96 \times 10^4) \times (4.98 \times 10^6)$  d)  $(6.05 \times 10^7) \times (3.11 \times 10^3)$

6) Round the following to 4 significant figures e)  $3.0207 \times 10^?$  3) Express the following in scientific notation f)  $1.00001 \times 10^?$  a) 0.1005 b) 0.0514 c) 0.75

©2009 Ezy Math Tutoring | All Rights Reserved a) 42.567 b) 0.39848 13 www.ezymathtutoring.com.au

Chapter 1: Number Exercise 2: Scientific Notation & Significant Figures c) 17152.54 d) 11.111111

7) Round the following to 3 significant figures b) 555.55 c) 1012 d) 0.82556 e) 212.75 f) 10001 a) 19.672

8) The speed of light in a vacuum is  $3 \times 10^8$  metres per second a) How far does light travel in 10 seconds? b) How long does light take to travel 90000 metres? c) There are approximately 31.5 million seconds in a year. How far does light travel in one year? 9) The closest star to Earth is approximately 4.3 light years away.



How long would it take a rocket travelling at 40, 000 km per hour to reach it?

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com. au Exercise 3 Consumer Arithmetic ©2009 Ezy Math Tutoring | All

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Exercise 3: Consumer Arithmetic 1) You get a part time job that pays a wage

of \$15 per hour. How much would you earn (before tax) in each of the

following weeks? d) Per day (Assume an equal payment per month

regardless of number of days, and assume you work 5 days a week, ignore

public holidays) ) Worked 10 hours b) Worked 12 hours c) Worked 32 hours

d) Worked 15 hours e) Worked 9 hours f) Worked 36 hours 2) In your next job

you are given a salary of \$38, 000 per annum. How much would you be paid:

3) In your next job you are given \$200 per week plus a commission of 5% of

all your sales. How much would you earn in each of the following weeks? a)

Sales of \$500 b) Sales of \$1000 c) Sales of \$5000 d) Sales of \$20000 e) What

must the value of your sales be if you needed to earn \$2200 for a week? a)

Per month b) Per week c) Per fortnight 4) In your next job you are required to

work overtime, but get paid more for doing so.

The agreement is: The first 35 hours work are paid at the rate of \$20 per

hour The next 5 hours work are paid at one and a half times your normal rate

All hours worked above this are paid at twice your normal rate How much

would you earn for working the following hours per week? a) 30 hours ©2009

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Chapter 1: Number Exercise 3: Consumer Arithmetic b) 35 hours c) 37 hours

d) 40 hours e) 46 hours f) 50 hours 5) Assume you are working a job that

pays a salary of \$52, 000 per annum a) If taxation is deducted at the rate of

20%, how much would you actually receive per week? ) If taxation is deducted at the rate of 15%, superannuation at the rate of 2%, and Medicare levy at the rate of 1.5%, how much would you actually receive per week? c) If the first \$12,000 of your income is not taxed, but the remainder is taxed at 20%, how much would you actually receive per week? d) If the first \$6,000 of your income is not taxed, but the remainder is taxed at 15%, and you have to pay a Medicare levy of 2% on your whole income, how much would you actually receive per week? ©2009 Ezy Math Tutoring | All Rights

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Consumer Arithmetic 6) Complete the following table, assuming interest is simple

Principal (P)	Interest Rate (R)	Time (T) (in years)	Total Interest (I)
\$20,000	5%	5	\$2,000
\$10,000	8%	4	\$2,500
\$7,500	10%	10	\$8,000
		5	\$4,000
		8	\$750

7) Which of the following pairs of options costs the least, and by how much? a) Buying petrol at \$1.40 per litre, or at \$1.50 per litre with a 5% discount b) Buying a lounge suite for \$1200 cash, or a \$900 lounge suite on credit with a simple interest rate of 10% per annum for 3 years ) Buying a new TV for \$2000 cash, or lay-by of 5 payments of \$400 d) A company offers an exercise system, for 6 equal monthly instalments of \$49.95, plus postage & handling of \$19.95, or a one off cash payment of \$300 with no postage or handling fee. You would have to borrow the \$300 at a simple interest rate of 8% per annum, for 6 months. 8) A store advertises a discount of 10% off all marked prices. You also have a discount card that entitles you to 15% off your purchases. Calculate the price you pay for each of the following items a) A pair of shoes with a marked price of \$120 ©2009

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Chapter 1: Number Exercise 3: Consumer Arithmetic b) A dining set with a

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marked price of \$200 c) A roll of carpet of 20 metres in length with a marked price of \$15 per metre d) A stereo system with a marked price of \$567 9)

Answer the following using the information from question 8 a) Is it cheaper to receive the 15% card discount, then the 10% store discount, or the other way around? Prove your answer with at least two examples. b) Is it cheaper to receive the 10% store discount and 15% card discount, or to receive 25% discount (10 + 15) immediately off the purchase price?

Prove your answer. 10) (Challenge question) The marked price of a bike has fallen off, and when you take it to the register you are charged \$229. 50 after both discounts. How much was the original marked price? (Use guess

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Year 9 Mathematics Chance & Data ©2009 Ezy

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Useful formulae and hints The probability of an event occurring can be calculated in two ways ? Theoretical probability

(  $\frac{\text{Number of favourable outcomes}}{\text{Total number of possible outcomes}}$  ) ?

Predictions based on previous data or trials If using the latter, the number of trials should be large, and the trials repeatable under the same

circumstances to give the data validity. The more external factors affecting

the trials, the less valid the results and hence predictions made from those

results. Examples may include scores when throwing darts, running times,

test scores, where other factors may influence the results If predicting

probability based on theory, for 2 events occurring at the same time, the

sample space must include all possible combinations of the events.

For example, if two coins are tossed there are 4 possible outcomes (HH, HT, TH, TT) When calculating probabilities for repeated events, the replacement or non replacement of an item (for example a card) before the second event will affect the sample space, and hence the probability. Example: If a red card is drawn from a pack (probability  $\frac{1}{2}$ ), not replaced, the probability of drawing another red card is now  $\frac{1}{5}$  (since there is one less red card that can be drawn, and one less card in the pack)

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A cumulative frequency table or graph is a “running total” of the number of scores in a set. Example

Score	1	2	3	4
Frequency	5	2	3	6
Cumulative frequency	5	$5+2=7$	$7+3=10$	$10+6=16$

The final cumulative frequency should equal the total number of individual scores. When dealing with grouped data, the exact median cannot be found, since the individual scores are not known (only the range of each group is known), therefore a modal class is found. This is the group that would contain the median. Example

Group	10-20	21-30	31-40	41-50
Frequency	5	2	5	7

There are 19 scores, so the median would be the 10th score. This score occurs in the class 31-40; this is the modal class. Without further information the exact value of the median cannot be calculated

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The range of a set of scores is the difference between the highest and lowest scores. The upper quartile is the median of the upper half of the scores in the data set. The lower quartile is the median of the lower half of the scores in the data set. The inter-quartile range is the difference between the upper and lower quartiles.

Example: For the data set 1, 3, 5, 6, 7, 8, 9, 15, 22, 31, 35 The median is the 6th score, which is 8 The lower quartile is 5 (the median of the subset 1, 3, 5, 6, 7) The upper quartile is 22 (the median of the subset 9, 15, 22, 31, 35) The inter-quartile range is 17 (22-5) The range is 34 (35-1) At this level standard deviation is calculated with the aid of a calculator The mean of a set of a data = Example: Mean of 2, 4, 5, 10, 12, 21  
 = ? ?? ??? ?? ?????? ?? ? ??? ?? ? ?????? ??

To calculate the missing value from a set of scores given the mean, calculate the sum of the scores (= mean x number of scores), and use it to find the missing scores Example: A data set has a mean of 5; its scores are 1, 3, 4, 4, x, 7, 10 ©2009 Ezy Math Tutoring | All Rights Reserved 23 www.

ezyemathtutoring. com. au = 9 There are seven scores, so the sum of the scores is  $5 \times 7 = 35$  The known scores add to 29, so the score that makes the set add to 35 (x) is 6 Graphs can show ? Changes over time ? Records of certain events (for example number of students getting 60% on a test) ?

Quantities at a point in time Different types of graphs are more suitable than others depending on the information to be shown ©2009 Ezy Math Tutoring | All Rights Reserved 24 www. ezyemathtutoring. com. au Exercise 1 Simple Probability ©2009 Ezy Math Tutoring | All Rights Reserved 25 www.

ezyemathtutoring. com. au Chapter 2: Chance & Data Exercise 1: Simple Probability 1) Peter plays ten pin bowling; his last 30 scores have been graphed in a frequency chart, shown here Bowling scores N u m b e r o f 12 s c o r e s 10 8 6 4 2 0 161-170 171-180 181-190 191-200 201-210 211-220 251-260 Score Range Basing you answers on the chart data ) Is Peter more likely to score 205 or 185 when he next bowls? b) Is he more or less likely to

score over 200 when he next bowls? c) What would be his probability of scoring over 250 when next he bowls? d) What would be his probability of scoring between 201 and 210 when next he bowls? e) Discuss a major drawback with using this chart to predict the probabilities of future scores

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SUM of TWO DICE	2	3	4	5	6	7	8	9	10	11	12
Frequency	8	21	30	42	49	62	51	41	28	21	7

Based on his table: a) What total is most likely to be rolled by two dice? b) What is the most likely double? c) What total is least likely to be rolled by two dice 27 www. ezymathtutoring. com. au ©2009 Ezy Math Tutoring | All Rights Reserved Chapter 2: Chance & Data Exercise 1: Simple Probability d) Is he more likely to roll a sum of 10 or a sum of 6 with two dice? e) Is this data more reliable than that of Q1? Give two reasons to support your answer 3) What is the theoretical probability of each of the following? ) A head being thrown when a coin is tossed b) A blue sock being taken from a draw containing 3 blue and 5 red socks c) The number 2 being rolled on a dice d) An even number being rolled on a dice 4) A card is drawn from a standard pack of 52 cards. What is the probability of the card being: a) A black card b) A club c) An ace d) A black 2 e) A picture card f) The 2 of diamonds 5) A man throws two coins into the air a) List the possible combinations, and from this table: b) What is the probability of throwing two heads? c) What is the probability of throwing a head and a tail? ©2009

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Chapter 2: Chance & Data Exercise 1: Simple Probability d) If the first coin lands on a head, is the second coin more likely or less likely to be a head? 6)

A coin is tossed and a dice is rolled a) List the possible combinations of the coin and dice, and from this table: b) What is the probability of throwing a six and a head? c) What is the probability of throwing an odd number and a tail?

d) What is the probability of throwing a number higher than 4 and a head? e)

What is the probability of throwing a head and a 2 or a head and a 4? ) A

card is drawn from a normal pack. It is not replaced and a second card is

drawn. a) If the first card is red, what is the probability that the second card

is also red? b) If the first card is red, what is the probability that the second

card is black? c) If the first card is an ace, what is the probability that the

second card is also an ace? d) If the first card is the jack of clubs, what is the

probability that the second card is the jack of clubs? 8) A set of cards

consists of 10 red cards, numbered 1 to 10 and 10 black cards numbered 1

to 10 a) What is the probability of pulling a 10 at random? ) What is the

probability of pulling a black card at random? c) What is the probability of

pulling a red 2 at random? d) What is the probability of pulling a red 2 on the

second draw if the first card is a black 2, and it is not replaced? ©2009 Ezy

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Chapter 2: Chance & Data Exercise 1: Simple Probability e) What is the

probability of pulling an 8 on the second draw if the first card is an 8, and it

is not replaced? 9) Consider the word ANATOMICALLY a) What is the

probability that a randomly chosen letter from this word will be an L? ) What

is the probability that a randomly chosen letter from this word will be an A?

c) What is the probability that a randomly chosen letter from this word will

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not be a vowel d) What is the probability that a randomly chosen letter from this word will be a Z? 10) What is the probability that a digit chosen

randomly from all digits (0- 9) is: a) A prime number? b) An even number? c)

Not 7? d) Greater than 4? e) Less than 10? ©2009 Ezy Math Tutoring | All

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[www. ezymathtutoring. com. u](http://www.ezymathtutoring.com.au) Chapter 2: Chance & Data Exercise 2: Data

Representation & Analysis 1) Construct a cumulative frequency table from

the following bar graph Test Scores of Class N u m b e r 7 6 5 4 3 2 1 0 s t u

d e n t o s f Score range How many students sat the test, and how many

passed? 2) Construct a cumulative frequency histogram from the following

data of the weights of 30 people in a group (in kgs) 72, 73, 73, 75, 77, 77,

78, 80, 83, 84, 84, 84, 85, 85, 88, 88, 90, 92, 92, 93, 95, 95, 96, 97, 97, 98,

98, 100, 103, 104 3) The following data shows the time taken for the

members of an athletic club to run 100 metres 12. 2, 12. , 13. 1, 13. 2, 13. 3,

13. 4, 13. 4, 13. 5, 13. 8, 14. 1, 14. 2, 14. 3, 15, 15. 2, 15. 5, 15. 5, 15. 7, 15.

8, 16, 16. 2 a) Group the data into class intervals b) Construct a histogram of

the grouped data c) Find the mean of the grouped data d) Find the modal

class of the grouped data ©2009 Ezy Math Tutoring | All Rights Reserved 32

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Representation & Analysis 4) The set of weights (in kg) from Q2 are repeated

here: 72, 73, 73, 75, 77, 77, 78, 80, 83, 84, 84, 84, 85, 85, 88, 88, 90, 92, 92,

93, 95, 95, 96, 97, 97, 98, 98, 100, 103, 104 Determine: ) The range of the

data b) The median of the data c) The upper and lower quartiles of the data

d) The inter-quartile range 5) Calculate the mean and standard deviation

(using a calculator) for the following sets of data a) 1, 2, 3, 4, 5, 6, 7, 8, 9 b)

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1, 1, 1, 1, 1, 1, 1, 1 c) 2, 4, 6, 8, 10, 100 d) 1, 22, 30, 40, 75, 90 6) A year 7 class takes a test and receives the following marks 35, 42, 48, 51, 54, 56, 60, 65, 66, 68, 70, 70, 72, 73, 75, 77, 80, 85, 87, 90, 94, 94, 97, 99 To get an A on the test a student must score more than the mean plus one standard deviation. How many students got an A on the test? 2009 Ezy Math Tutoring | All Rights Reserved 33 www. ezymathtutoring. com. au Chapter 2: Chance & Data Exercise 2: Data Representation & Analysis 7) The scores for a test to two different classes are shown under Class 1: 85, 96, 75, 84, 65, 91, 78, 82, 80, 70, 80, 58, 71, 78, 98, 99, 75, 62, 75 Class 2: 61, 53, 54, 75, 99, 98, 98, 96, 78, 57, 90, 75, 93, 51, 75, 96, 99, 59, 95 a) Calculate the mean and standard deviation for the two classes b) Draw a histogram for each data set c) Comment on the relationship between the histograms and the standard deviations 8) The mean of the following data set is 12.

What is the value of ???? 9) The mean of a set of 9 scores is 7. After another score is added the mean drops to 6. 5. What was the added score? 8, 10, 7, 4, 20, ? 52 , 51 , 41 , 21 ,?? ©2009 Ezy Math Tutoring | All Rights Reserved

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Expressions ©2009 Ezy Math Tutoring | All Rights Reserved 35 www.

ezymathtutoring. com. au Useful formulae and hints Index laws can be applied to operations involving variables. As long as the base (in this case the variable) is the same, the laws can be applied.  $a^m \times a^n = a^{m+n}$   
 $a^m \div a^n = a^{m-n}$   
 $(a^m)^n = a^{m \times n}$   
 $a^{-m} = \frac{1}{a^m}$   
 $a^0 = 1$   
 Example:  $(2^3)^4 = 2^{3 \times 4} = 2^{12}$   
 $2^3 \times 2^4 = 2^{3+4} = 2^7$   
 $2^3 \div 2^4 = 2^{3-4} = 2^{-1} = \frac{1}{2}$   
 $2^{-3} = \frac{1}{2^3}$   
 $2^0 = 1$  Remembering that  $2^0 = 1$  When adding or

subtracting fractions containing variables, the same rules apply as with numerical fractions; find a common denominator and convert both fractions to an equivalent fraction in the same denominator, then simplify Example  $\frac{1}{9} + \frac{2}{15} = \frac{5}{45} + \frac{6}{45} = \frac{11}{45}$  ©2009 Ezy Math Tutoring | All Rights Reserved 36 [www.zymathtutoring.com.au](http://www.zymathtutoring.com.au) When multiplying or dividing fractions containing variables, the same rules apply as with numerical fractions; multiply the numerators and multiply the denominators, then simplify the fraction. Use index laws when multiplying variables. For division remember to invert the second fraction and then multiply as above Example  $\frac{2}{3} \div \frac{4}{5} = \frac{2}{3} \times \frac{5}{4} = \frac{10}{12} = \frac{5}{6}$  To solve equations involving addition/subtraction only, isolate the variable by adding or subtracting the non variable from both sides of the equation Example  $7 = 2 + 5$   $7 - 5 = 2 + 5 - 5$   $2 = 2$

To solve equations involving addition/subtraction and multiplication/division, first add or subtract the non variable as above, then multiply or divided both sides of the equation by the co-efficient of the variable, to isolate the variable ©2009 Ezy Math Tutoring | All Rights Reserved 37 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au)

Example  $2x + 1 = 4$   $2x + 1 - 1 = 4 - 1$   $2x = 3$   $2x \div 2 = 3 \div 2$   $x = 1.5$  If  $x = 1.5$ , then  $2(1.5) + 1 = 3 + 1 = 4$  For example,  $x^2 = 9$ , but  $3^2 = 9$ ,  $(-3)^2 = 9$ , so  $x = 3$  or  $x = -3$  Solve inequalities exactly the same way as solving equations, but keeping the inequality sign where the = sign would normally be.

The exception is if multiplying or dividing by a negative number, flip the inequality sign Examples  $2x + 1 > 6$   $2x + 1 - 1 > 6 - 1$   $2x > 5$   $2x \div 2 > 5 \div 2$   $x > 2.5$  ©2009 Ezy Math Tutoring | All Rights Reserved 38 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au)  $8 < 2x$   $8 \div 2 < 2x \div 2$   $4 < x$  <https://assignbuster.com/year-9-maths-revision-essay/>

+  $2^6 < 3^3$  A negative index can be turned into a positive one by inverting the number Example  $2^{-1} = \frac{1}{2}$   $3^{-2} = \frac{1}{3^2}$  Note only the number with the index is inverted To factorize an expression remove the highest common factor of all terms, place outside the bracket and divide each term by this factor to leave the remainders in the brackets Examples  $2x^2 + 4x = 2(x + 2)$   $3x^2 + 6x = 3x(x + 2)$   $4x^2 + 8x = 4x(x + 2)$   $2x^2 + 4x = 2(x + 2)$  ©2009 Ezy Math Tutoring | All Rights Reserved

39 www. ezymathtutoring. com. au To expand an expression, multiply every term in the bracket by the common factor. Note this method can be use to check the correctness of factorization Examples  $2(x + 2) = 2x + 4$   $3(x + 2) = 3x + 6$   $4(x + 2) = 4x + 8$   $2(x + 2) = 2x + 4$   $3(x + 2) = 3x + 6$   $4(x + 2) = 4x + 8$  ©2009 Ezy Math Tutoring | All Rights Reserved

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Expressions Exercise 1: Simplifying Expressions Using Index Laws 1) Simplify

the following using index laws a)  $6^3 \times 6^2$  b)  $2^4 \times 2^3$  c)  $8^2 \times 4^2$  b)  $20^2 \times 5^2$  d)  $5^2 \times 4^2$  5) Simplify b)  $2^3 \times 2^2$  d)

$(2^3)^2$  c)  $(2^3)^2 \times 2^2$  e)  $(2^3)^2 \times 2^2$  a)  $2^3 \times 2^2$  c)  $2^3 \times 2^2$  2)

Simplify the following b)  $2^3 \times 2^2$  d)  $2^3 \times 2^2$  e)  $(2^3)^2 \times 2^2$  a)  $2^3 \times 2^2$

$(2^3 + 3)$  b)  $2^3 \times 2^2$  )1 +  $2^3$  c)  $2^3 (2 + 3)$  d)  $2^3 (2 + 3)$  e)  $2^3 (2^3 + 4)$  a) b) c)

d)  $2^3 \times 2^2$   $2^3 \times 2^2$  3) Simplify the following a)  $2^3 \times 2^2$  b)  $5^2 \times 3^2$  c)

d)  $3^2 + 3^2 (2^3)^2$  e)  $2^3 + 2^3$  6) Simplify the

following  $2^3 \times 2^2$   $2^3 \times 2^2$   $2^3 \times 2^2$   $2^3 \times 2^2$  e)  $2^3 \times 2^2 + 3^2 \times 3^2$  ©2009 Ezy Math

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Chapter 3: Algebraic Expressions Exercise 1: Simplifying Expressions Using

Index Laws 7) Put the following in order from smallest to largest for  $x > 1$

5,  $5^5$ ,  $5^{5^5}$ ,  $(5^5)^{5^5}$ ,  $5^{5^5}$ ,  $5^8$  8) James asks Alan how far it is from his house to school.

Alan replies: “ If you square the distance and multiply it by the distance to the power of 3 you get 32” How far is Alan’s house from school (in kilometres)? ©2009 Ezy Math Tutoring | All Rights Reserved 43 www.

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Chapter 3: Algebraic Expressions Exercise 2: Expressions Involving Fractions

1) Simplify the following a)  $\frac{2x^2 + 3x - 5}{x^2 - 4}$  b)  $\frac{3x^2 - 5x + 2}{x^2 - 9}$  c)  $\frac{4x^2 - 7x + 3}{x^2 - 1}$  d)  $\frac{5x^2 - 8x + 4}{x^2 - 16}$  e)  $\frac{6x^2 - 9x + 4}{x^2 - 25}$

2) Simplify the following a)  $\frac{2x^2 + 3x - 5}{x^2 - 4} + \frac{3x^2 - 5x + 2}{x^2 - 9}$  b)  $\frac{4x^2 - 7x + 3}{x^2 - 1} + \frac{5x^2 - 8x + 4}{x^2 - 16}$  c)  $\frac{6x^2 - 9x + 4}{x^2 - 25} + \frac{7x^2 - 10x + 6}{x^2 - 36}$  d)  $\frac{8x^2 - 11x + 7}{x^2 - 49} + \frac{9x^2 - 12x + 8}{x^2 - 64}$

3) Simplify the following a)  $\frac{2x^2 + 3x - 5}{x^2 - 4} - \frac{3x^2 - 5x + 2}{x^2 - 9}$  b)  $\frac{4x^2 - 7x + 3}{x^2 - 1} - \frac{5x^2 - 8x + 4}{x^2 - 16}$  c)  $\frac{6x^2 - 9x + 4}{x^2 - 25} - \frac{7x^2 - 10x + 6}{x^2 - 36}$  d)  $\frac{8x^2 - 11x + 7}{x^2 - 49} - \frac{9x^2 - 12x + 8}{x^2 - 64}$  e)  $\frac{10x^2 - 13x + 9}{x^2 - 81} - \frac{11x^2 - 14x + 10}{x^2 - 100}$

4) Simplify the following a)  $\frac{2x^2 + 3x - 5}{x^2 - 4} \times \frac{3x^2 - 5x + 2}{x^2 - 9}$  b)  $\frac{4x^2 - 7x + 3}{x^2 - 1} \times \frac{5x^2 - 8x + 4}{x^2 - 16}$  c)  $\frac{6x^2 - 9x + 4}{x^2 - 25} \times \frac{7x^2 - 10x + 6}{x^2 - 36}$  d)  $\frac{8x^2 - 11x + 7}{x^2 - 49} \times \frac{9x^2 - 12x + 8}{x^2 - 64}$  e)  $\frac{10x^2 - 13x + 9}{x^2 - 81} \times \frac{11x^2 - 14x + 10}{x^2 - 100}$

5) Simplify the following a)  $\frac{2x^2 + 3x - 5}{x^2 - 4} \div \frac{3x^2 - 5x + 2}{x^2 - 9}$  b)  $\frac{4x^2 - 7x + 3}{x^2 - 1} \div \frac{5x^2 - 8x + 4}{x^2 - 16}$  c)  $\frac{6x^2 - 9x + 4}{x^2 - 25} \div \frac{7x^2 - 10x + 6}{x^2 - 36}$  d)  $\frac{8x^2 - 11x + 7}{x^2 - 49} \div \frac{9x^2 - 12x + 8}{x^2 - 64}$  e)  $\frac{10x^2 - 13x + 9}{x^2 - 81} \div \frac{11x^2 - 14x + 10}{x^2 - 100}$

6) Simplify the following a)  $\frac{2x^2 + 3x - 5}{x^2 - 4} + \frac{3x^2 - 5x + 2}{x^2 - 9} + \frac{4x^2 - 7x + 3}{x^2 - 1}$  b)  $\frac{5x^2 - 8x + 4}{x^2 - 16} + \frac{6x^2 - 9x + 4}{x^2 - 25} + \frac{7x^2 - 10x + 6}{x^2 - 36}$  c)  $\frac{8x^2 - 11x + 7}{x^2 - 49} + \frac{9x^2 - 12x + 8}{x^2 - 64} + \frac{10x^2 - 13x + 9}{x^2 - 81}$  d)  $\frac{11x^2 - 14x + 10}{x^2 - 100} + \frac{12x^2 - 15x + 11}{x^2 - 121} + \frac{13x^2 - 16x + 12}{x^2 - 144}$

7) Three friends, Alan, Colin and William share a pizza. Alan eats half of the pizza, and Colin eats a third of the pizza. What fraction of the original pizza is left for William? ©2009 Ezy Math Tutoring | All Rights Reserved + ??? ??? 45 www. ezyemathtutoring. com. au ??? ??? ? ?

Chapter 3: Algebraic Expressions c) d) e)  $\frac{2x^2 + 3x - 5}{x^2 - 4} - \frac{3x^2 - 5x + 2}{x^2 - 9} + \frac{4x^2 - 7x + 3}{x^2 - 1}$  7) Three friends, Alan, Colin and William share a pizza. Alan eats half of the pizza, and Colin eats a third of the pizza. What fraction of the original pizza is left for William? ? ? ? ?

Exercise 2: Expressions Involving Fractions ? ? ? ? ??? ? ? ? ? ? ? 8) Some students ask their maths teacher how old he is. The teacher replies “ Half of my age subtract one-third of my age equals 7. ” How old is the maths teacher? 9) Pocket money is divided between three brothers according to

their ages. Tony receives half of the total pocket money paid out, while Michael receives one-fifth of the total. What fraction of the pocket money does the middle child, Peter, receive? ©2009 Ezy Math Tutoring | All Rights Reserved 46 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) Exercise 3 Solving Equations ©2009 Ezy Math Tutoring | All Rights Reserved 7 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) Chapter 3: Algebraic Expressions Exercise 3: Solving Equations 1) Solve each of the following equations a)  $5 = 3 + x$  2) Solve each of the following equations b)  $2x + 6 = 4x$  c)  $x + 8 = 6x$  d)  $x + 8 = 6x$  e)  $2(x + 1) = 1 + x$  f)  $3(x + 8) = 2x + 4$  g)  $4(x + 0) = 1 + x + (2 + x) + x = 6$  3) A man declares " If you add 4 to my age and double the result, you will get 3 times my age less 22. " How old is the man?  $x + 5 = 3x - 22$  d)  $2(x + 4) = 3x + 1$  e)  $3(2x + 3) = 2x + 1$  4) Half of a number equals twice that number plus 6. What is the number? ) If you subtract 4 from a number and halve the result, you will get twice the same number less 8. What is the number? 6) How many solutions does each of the following equations have? 7) From your answers to question 6, a)  $2x + 4 = 4$  b)  $2x + 4 = 9$  c)  $2x + 4 = 0$  e)  $2x + 4 = 3$  how does the value of c in the equation  $2x + 4 = c$  affect the number of solutions of the equation? 8) Solve the following equations a)  $2x + 4 = 4$  b)  $2x + 4 = 8$  d)  $2x + 4 = 16$  f)  $2x + 4 = 4$  ©2009 Ezy Math Tutoring | All Rights Reserved c)  $3x + 4 = 27$  d)  $3x + 4 = 6$  48 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) Chapter 3: Algebraic Expressions Exercise 3: Solving Equations )  $2x + 4 = 4$  9) Solve the following inequalities a)  $2x + 9 > 1 + x$  b)  $x + 6 < 3x$  c)  $2x + 3 > 4$  f)  $2x + 4 > 0$  d)  $-x + 1 < 5$  e)  $2(x + 6) > 3 + x$  g)  $x + 2 < 4$  h)  $x > 2 < 6$  ©2009 Ezy Math Tutoring | All Rights Reserved 49 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) Exercise 4 Fractional & Negative Indices ©2009 Ezy Math Tutoring | All Rights Reserved 50 [https://assignbuster.com/year-9-maths-revision-essay/](http://www.https://assignbuster.com/year-9-maths-revision-essay/)

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Fractional & Negative Indices 1) Rewrite the following with positive indices a)

1)  $2x^{-3}y^2$  b)  $3x^2y^{-4}$  c)  $4x^{-5}y^3$  e)  $5x^2y^{-6}$  f)  $6x^{-7}y^4$  4) Simplify the following, expressing our

answer in positive indices e)  $(2x^3y^2)^{-2}$  d)  $(3x^2y^3)^{-1}$  a)  $4x^2y^3$  ?

$2x^3y^2$  b)  $4x^2y^3$  ?  $2x^3y^2$  c)  $4x^2y^3$  ?  $2x^3y^2$  d)  $4x^2y^3$  ?  $2x^3y^2$  2) Express the

following using indices a)  $v^{-2}$  b)  $v^{-3}$  c)  $v^{-4}$  ? 5) Simplify the following,

expressing your answer with positive indices e)  $(4x^2y^3)^{-1}$  ?  $(2x^3y^2)^{-2}$  a)

$4x^2y^3$  ?  $2x^3y^2$  b)  $(4x^2y^3)^{-1}$  ?  $(2x^3y^2)^{-2}$  c)  $(x^2y^3)^{-1}$  ?  $(x^3y^2)^{-2}$  ? ? ? ? ? ? d)  $v^{-2}$

$v^{-3}$  ? ? 3) Simplify the following, expressing your answer in positive indices ? ?

e)  $v^{-2}$  ? ? d)  $(2x^3y^2)^{-1}$  ?  $(2x^3y^2)^{-2}$  6) Simplify the following, expressing your

answer in positive indices e)  $(x^2y^3)^{-1}$  ?  $2x^3y^2$  ? a)  $x^2y^3$  ? ? a)  $x^2y^3$  ?  $x^3y^2$  )

c)  $(x^2y^3)^{-1}$  ?  $(x^3y^2)^{-2}$  ? ? ? ? ©2009 Ezy Math Tutoring | All Rights Reserved d)

$2x^3y^2$  ?  $3x^2y^3$  b)  $x^2y^3$  ? ? ? ? ? 51 www.ezymathtutoring.com.au Chapter

3: Algebraic Expressions Exercise4: Fractional & Negative Indices c)

d)  $x^2y^3$  ? ? ?  $x^3y^2$  ? 7) State whether the following statements are true of

false. If false give the correct answer e)  $(x^2y^3)^{-1}$  ? ? ? ? ? a)  $2x^3y^2 = ?$

b)  $x^2y^3 = x^3y^2$  d) e)  $x^2y^3$  ? c)  $x^2y^3$  ?  $x^3y^2 = x^3y^2$  ? ? ? ? ? ? ? ? ? ? ?

$= x^2y^3$  ? = ? ? ? ©2009 Ezy Math Tutoring | All Rights Reserved 52 www.

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Chapter 3: Algebraic Expressions Exercise5: Expanding & Factorizing 1)

Expand the following by removing brackets and collecting and simplifying

like terms where possible a)  $(x + y)^2 + (x + y)$  b)  $(x + y)^2 + (x + y)$

$(x + y)^2 + (x + y)$  d) c)  $2(x + y)^2 + (x + y)$  e)  $(x + y)^2 + (x + y)$

(? a)  $2x^2 + 4x$  b)  $3x^2 + 4x$  a)  $2x^2 + 1 + (2 + x)^3 + (x + y)^3$  ? ?

(? (x + y)^2 + (x + y)^2 b)  $3x^2 + 2(x + y)^3 + (x + y)^2$  d) ? )3

+ ? (? 2 + )2 + ? (?? 2) Expand the following by removing brackets and collecting and simplifying like terms where possible ??? ? )? ?? 2(???? (2? )1 + ?? 4) Factorize the following expressions a) ?? + )2 + ? (??? (1 ? ?)?? c) 3? )2 + ? ( + )? ? 2(?? c) 4???? ? 6???? b) 2?? ? )2 + ? (??? (2 + ? )?? d) ? )5 ? (? 2 ? )? + 3(?? e) 4? )? ? 3(? + )3 ? ?(?? f) 2? )? 2 ? 3(? 3 ? )4 ? ?(?? 3) Expand the following by removing brackets and collecting and simplifying like terms where possible d) 8?? 2 ? ??? + 6???? 5) Factorize the following expressions a) 8?? 4 ? ????????? b) 5?? 01 + ????? e) 2?? 4 + ??? ? 8???? g) ? )? ? 2(? 2 ? )2 ? ? 2(?? c) 3???????? ? 2???? e) ? ????????? 2 ? ??? ? d) 4???? + 8?? 8 ? ????? ©2009 Ezy Math Tutoring | All Rights Reserved 54 www.

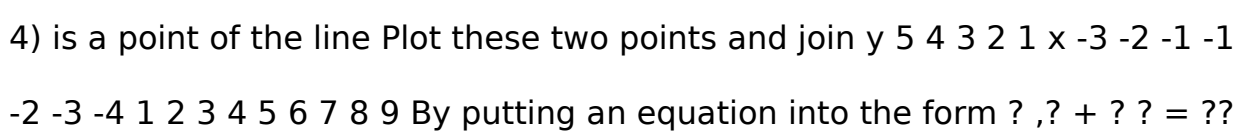
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Expanding & Factorizing 6) Factorize the following expressions a) 4????????? + 8???? 21 + ????? b) ?? ????????????????? ? ?????????? c) ? )? ? ? ( + )? ? ? (?? d) ? )? ? ? (? + )? ? ? (?? e) ? )? ? 1(? ? )1 ? ?(?? ©2009 Ezy Math Tutoring | All

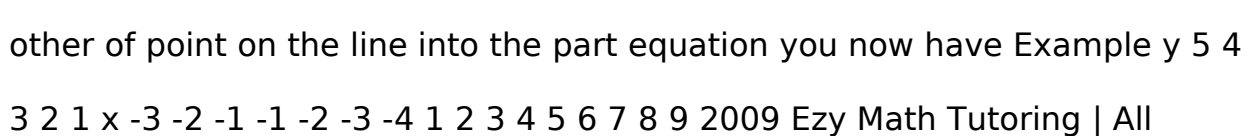
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www. ezymathtutoring. com. au Useful formulae and hints An example showing how to calculate midpoint, gradient and length from a graph is given before exercise 1 Using the points ( 3, 2) ??? 1, ? 4) as an example To determine the above using formulae: Midpoint of a line segment = ? ? ( 2, ? 1) ? ? ??? ????? ? Make sure that you use the same point for the same subscript; here ????? = 3, so ????? = 2, NOT ? 4 Length of a line segment = ? ( ????? ? ????? ) ? + ( ????? ? ????? ) ? = ? (1 ? 3) ? + ( ? 4 ? 2) ? = v4 + 36 = v40 Gradient of a line = ????? ????? , ?= ? ??? ????? ? ? , ?= = ????? ??? = 3 When graphing lines only two points are necessary. If graphing from a table of values, choose two points If graphing from an equation, set ? 0 = ?? and

calculate the value of  $y$  at this point, then set  $x = 0$  and calculate the value of  $y$  at this point  $4 - 2 = 2$  Example ©2009 Ezy Math Tutoring | All Rights Reserved 57 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) When  $x = 2$ ,  $y = 4 - 2 = 2$ ,  $(2, 0)$  is a point of the line When  $x = 0$ ,  $y = 4 - 0 = 4$  So  $(0, 4)$  is a point of the line Plot these two points and join



By putting an equation into the form  $y = mx + c$  the above points can be more easily calculated Furthermore, the gradient can be easily determined: (it is the value of  $m$  in the above)  $3 - 9 = -6$  Example  $3x + 6 = 0$  ©2009 Ezy Math Tutoring | All Rights Reserved 58 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au)  $3x + 2 = 0$  Gradient of the line is 2, and the graph crosses the  $y$  axis (when  $x = 0$ )  $y = 3$  Two equations that have the same value of  $m$  when both are in the above format are parallel Find the value of  $c$  (it is the point where  $x = 0$  that is where the graph crosses the  $y$  axis) To determine the equation of a graph Substitute any other of point on the line into the part equation you now have Example  $y = 5 - 4x$



©2009 Ezy Math Tutoring | All Rights Reserved 59 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) When  $x = 2$ ,  $y = 2 - 4 = -2$  Another point is  $(0, 2)$  So  $0 = 2 - 2 = 0$  The equation is now  $2x - 4 = 0$  ©2009 Ezy Math Tutoring | All Rights Reserved 60 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) Exercise 1 Determining Midpoint, Length & Gradient ©2009 Ezy Math Tutoring | All Rights Reserved 61 [www.ezymathtutoring.com.au](http://www.ezymathtutoring.com.au) Chapter 4: Coordinate Geometry Exercise 1: Determining Midpoint, Length & Gradient 1) Each part below lists a pair of coordinates. For each pair you are required to: Plot the points on a graph, and join to form a line segment Determine the midpoint of the line segment drawn from the diagram Using the line segment



as the hypotenuse, construct a right angled triangle Use the above construction and Pythagoras' Theorem to determine the length of the line segment State whether the line segment has a positive or negative gradient (slope) Using the right angled triangle drawn to determine the value of the gradient of the line segment (gradient = rise/run) ? ? Use the following example as a guide For the points (2, 1) and (3, 4) y 4 3 2 1 x 1 2 3 4 ©2009 Ezy Math Tutoring | All Rights Reserved 62 www. zymathtutoring. com. au

Chapter 4: Coordinate Geometry Exercise 1: Determining Midpoint, Length & Gradient Midpoint is the (x, y) coordinate of the point halfway along line Here midpoint is (2. 5, 2. 5) Gradient is positive Right angled triangle drawn y 4 3 2 1 x 1 2 3 4 Length of hypotenuse (line segment) = c From Pythagoras: ?? = ?? + ?? ?? = 1? + 3? ? =  $\sqrt{10}$  ?? = 1 + 9 = 10 Note leave in square root form if cannot be simplified Gradient = rise/run = ??? ??? = = 3 ? ? ©2009 Ezy Math Tutoring | All Rights Reserved 63 www. ezymathtutoring. com. au

Chapter 4: Coordinate Geometry Exercise 1: Determining Midpoint, Length & Gradient ) (1, 1) and (4, 5) b) (1, 1) and (2, 2) c) (-2, 10) and (4, 2) d) (-1, -1) and (1, 3) e) (2, 1) and (3, -2) f) (3, -1) and (5, -4) g) (-1, -2) and (2, 3) h) (-3, 8) and (2, -4) i) (0, -1) and (2, 1) j) (0, 1) and 1, -4) 2) For each of the pairs of points given below, determine using the appropriate formula: ? ? ? The Midpoint of the line segment between the points The length of the line segment between the points The gradient of the line segment between the points a) (0, 0) and (3, 3) b) (2, 4) and (3, 6) c) (-2, 4) and (0, 8) d) (-1, 4) and (-4, -2) e) (0, 2) and (0, 8) ©2009 Ezy Math Tutoring | All Rights Reserved 64 www. zymathtutoring. com. au Chapter 4: Coordinate Geometry Exercise 1: Determining Midpoint, Length & Gradient f) (2, 0) and (2, 8) g) (-10, 10) and (0, -10) h) (3, -6) and (-6, 15) i) (-1, -1) and (-5, 15) j) (4, 10) and (-2, -2)

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Gradient/Intercept Form of Linear Equations ©2009 Ezy Math Tutoring | All Rights Reserved 68 www. ezymathtutoring. com. au Chapter 4: Coordinate Geometry Exercise 3: Gradient/Intercept Form 1) For each equation below state the value of the gradient, and the coordinate of the yintercept a)  $y - 3 + ? - 2 = ??$  b)  $y - 1 ? ? - 3 = ??$  d)  $?? - 3 = ??$  e)  $y - 2 = ??$  c)  $? = ??? ? - 5 + ?? ?$  f)  $? - 4 ? ? - 3 ? = ??$  g)  $? ? = ???$  ??? ? h)  $? ? = ??? ? - 6 + ?? ?$  2) Rearrange the following equations into the form  $?? + ? ? = ??$  a)  $? - 0 = 3 + ? + ??$  b)  $? - 0 = 4 ? ? ? ??$  c)  $2? - 0 = 6 ? ? - 4 + ??$  d)  $? ? - 0 = 2 ? ? ? ?? ?$  e)  $? - 0 = ? + ??$  g)  $? - 0 = 2 ? ? ?$  f)  $- ? - 0 = ? ? ??$  ©2009 Ezy Math Tutoring | All Rights Reserved 69 www. ezymathtutoring. com. au Chapter 4: Coordinate Geometry Exercise 3: Gradient/Intercept Form 3) Draw graphs of the following equations given the gradient and the y-intercept. State the equation of the line a) Gradient = 2,

y-intercept = 1 b) Gradient = 1, y-intercept = -2 c) Gradient = -2, y-intercept = -4 d) Gradient = 0, y-intercept = 3 e) Gradient = -? , y-intercept = 0 ? f)

Gradient = -3, y-intercept = ? ? g) Gradient = 1, y-intercept = 0 4) State if

the following pairs of lines are parallel, showing your working a) ? 1 ? ? 2

= ? , 3 + ? 2 = ?? b) ? 2 ? 2 = ? , 4 + ? = ?? c) 2? 7 ? ? 2 = ? , 5 ? ? 4 = ?? d)

2? 3 ? ? ? = ? , 0 = 3 + ? 2 + ?? e) 2?? 2 ? = ? , 0 = 4 ? ? 4 + ?? g) ? 4 = ? , 4

= ?? f) 3? + ? , 0 = 3 + ? 6 ? ??? ? 0 = 4 + ?? ? h) ? 2 = ? , 4 = ?? ©2009 Ezy

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Chapter 4: Coordinate Geometry Exercise 3: Gradient/Intercept Form 5)

Determine the equations of the graphs drawn below (3 questions per graph)

y (1) (2) 4 2 x -8 -6 -4 -2 2 4 6 8 -2 (3) -4 ©2009 Ezy Math Tutoring | All

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Geometry Exercise 3: Gradient/Intercept Form y (4) 4 (6) 2