

YEAR 8 EXAM REVISION SHEET

You will have 2 maths exams in Year 8, one without a calculator and one with a calculator. The best way to prepare for your maths exam is by doing lots of practice. Any areas that you don't understand or have found hard, be sure to ask your teacher for help with or look on Hegarty Maths for the associated video. Good Luck!

1. Which of the following are prime numbers, give a reason for your answers:
 - a. 7
 - b. 1
 - c. 14
 - d. 51
2. Evaluate the following:
 - a. 2^4
 - b. 3^0
 - c. $(-2)^6$
 - d. $(0.2)^3$
 - e. $\left(\frac{2}{3}\right)^3$
 - f. $(-4)^2$
3. Simplify the following leaving your answer in index form:
 - a. $2^6 \times 2^3$
 - b. $5^7 \div 5^2$
 - c. $(8^4)^2$
4. Write the following as a product of their prime factors using indices where appropriate
 - a. 48
 - b. 144
 - c. 198
 - d. 84
5. Use product of prime factors to determine if these are square or cube numbers:
 - a. 2450
 - b. 441
 - c. 19600
6. Use the prime factors to find the LCM and HCF of the following numbers:
 - a. 60 & 90
 - b. 280 & 700
 - c. 70, 116 & 126
7. The HCF of two numbers is 25. The LCM of the same two numbers is 550. What could my numbers be?
8. Complete the following sequences
 - a. 1, 4, 9, ?, ?
 - b. 1, 3, 6, 10, ?, ?
 - c. 1, 8, 27, ?, ?
9. I want to chop two lengths of wood into pieces of equal size without any wastage. What is the biggest size each piece can be if the original planks are 1.25m and 85cm long?
10. I need to make teams of both 2, 6 and 9 for each activity on sports days. What the smallest number of students I need so no one is ever sat out?
11. Put the following information on a Venn Diagram $A = \{\text{square numbers}\}$, $B = \{\text{odd numbers}\}$ and $\xi = \{\text{integers from 1-10 inclusive}\}$
12. Use a Venn Diagram to work out the number of people who both swim and run. There are 40 people, 37 swim and 23 run. Everyone does at least one sport.
13. Evaluate the following:
 - a. $\sqrt{1000}$
 - b. $\sqrt[3]{125}$
 - c. $\sqrt{3025}$
 - d. $\sqrt[3]{-64}$
 - e. $\sqrt{4900}$
 - f. $\sqrt{0.09}$
 - g. $\sqrt[3]{216}$
 - h. $\sqrt{25x^2}$
14. Give a sensible estimate for the following. You must give a reason for your answer:
 - a. $\sqrt{42}$
 - b. $\sqrt[3]{25}$
15. Simplify:
 - a. $\frac{5x}{15}$
 - b. $\frac{6x+10}{2}$
 - c. $\frac{2p^2}{p}$
 - d. $\frac{7y}{4} \times \frac{8y}{5y}$
 - e. $\frac{2}{5a^2} + \frac{1}{a}$
 - f. $\frac{y^2}{9} - \frac{y^2}{18}$
 - g. $\frac{4}{y} - \frac{3}{z}$
 - h. $\frac{5}{9}r - \frac{3}{9}r$
 - i. $\frac{5z}{21} \div \frac{25}{42}$
 - j. $\frac{x}{7} + \frac{2x}{5}$
16. Simplify the following leaving your answer in index form:

- a. $4^5 \times 4^{-9}$ b. $10^{-7} \div 10^{-4}$
 c. $13^{21} \div 13^7$ d. $q^{-5} \times q^9$
 e. $((c^4)^6)^7$ f. $\frac{8^4 \times 8^7}{8^6}$

17. Factorise the following:

- a. $21x + 7$ b. $8a^3 - 16a$
 c. $z^2 - 11z$ d. $15u^2v^3 + 45t^2uv$
 e. $15yz + 6z$ f. $12ab^2 - 6a^2b + 24ab$

18. Find the next three terms and state the term to term rule:

- a. 9, 17, 25, 33, ...
 b. 6, 42, 294, 2058, ...
 c. 4444, 2222, 1111, 555.5, ...
 d. $1 - 4a$, $2 - a$, $3 + 2a$, $4 + 5a$, ...
 e. $1, z^3, z^6, z^9, \dots$

19. What is the n th term expression for the following sequences?

- a. 11, 14, 17, 20, 23, ... b. 27, 21, 15, 9, ...
 c. 7, 5.3, 3.6, 1.9, ... d. -2, 3, 8, 13, 18, ...
 e. $\frac{3}{8}, 1, \frac{13}{8}, \frac{9}{4}, \frac{23}{8}, \dots$ f. -1, -4, -7, -10,

20. For each of these sequences decide:

- i. What is the 85th term?
 ii. Is 323 a member of the sequence?
 a. 110, 95, 80, 65, b. -22, -19, -16, -13

21. Solve the following equations:

- a. $6f + 60 = 48$
 b. $43 = 11 - 4w$
 c. $\frac{r}{4} - 8 = 13$
 d. $5(3x - 4) = 145$
 e. $5x + 7 = 7x + 11$
 f. $11x - 12 = 3 - 4x$
 g. $11(x + 8) = 3(4 - 3x)$
 h. $\frac{9}{x} = 18$

22. Substitute $a = -4$, $b = \frac{3}{4}$, $c = 0.1$

into the following expressions

- a. $5bc$ b. $a^2 - 10b$

c. $3(ab - 20c)$ d. $\frac{3a}{2a-3b}$

23. Use the formula $G = \frac{2(u-v)}{w^2}$ to find the value of G when:

- a. $u = -3, v = -2, w = -1$
 b. $u = 2, v = -2, w = -6$

24. Janet is visiting a party and bringing some food. She buys 14 packs of pastries and an extra 5 individually. Unfortunately, Angela brings pastries too, bringing 11 packets and 26 extras. Given that they both brought the same number of pastries in total:

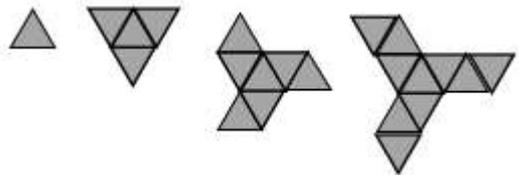
- a. Write down and solve an equation for the number of pastries in one packet.
 b. How many pastries do the party goers need to eat to finish them all?

25. Expand and Simplify:

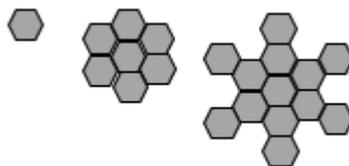
- a. $5(x + 4) + 3(x + 11)$
 b. $7(x - 5) - 2(2x - 3)$
 c. $3(4x - 1) - x - 3$
 d. $-7(3 - 2x) - 2(3 + 7x)$

26. Find the n th term formula for each sequence of shaded shapes:

a.



b.



c.



27. Simplify as far as possible:

- a. $5x^3y \times 2x^3y^2$ b. $48a^6b^6 \div 12a^4b^5$

c. $4x \times 5y \times 9x$ d. $\frac{75uv^2}{15uv}$
 e. $17x^2 + 5y^2 - x^2$ f. $x^2y + xy^2 - yx^2$

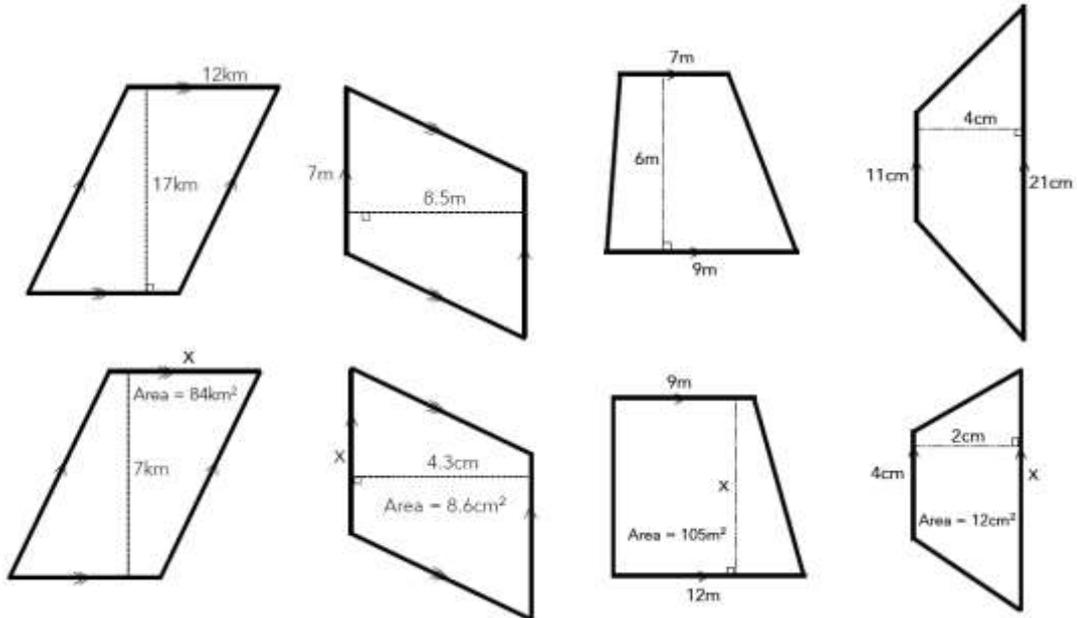
28. Draw a 5cm line, create a perpendicular bisector of the line. Now bisect one of the right angles created

29. Draw a 5cm line and pick a point below the line. Construct a perpendicular line from this point to the line.

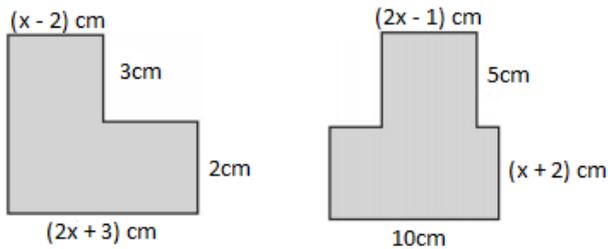
30. Construct an equilateral triangle

31. Construct a right-angle triangle with sides 6cm, 8cm and 10cm

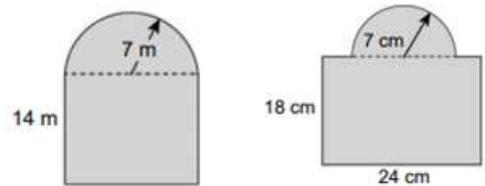
32. Calculate the area of the following shapes or the missing side



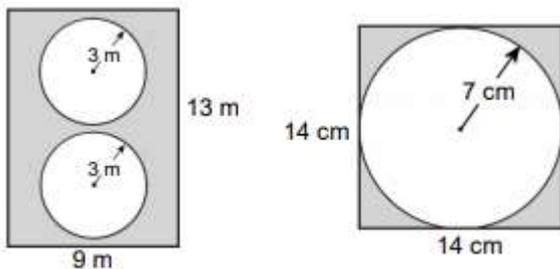
33. Calculate the area of the following shapes



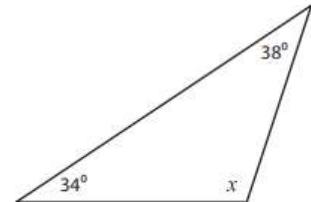
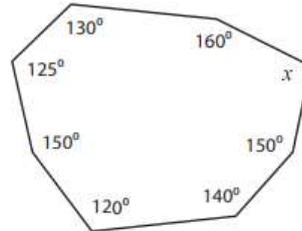
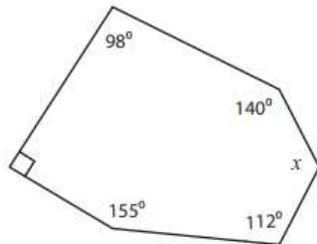
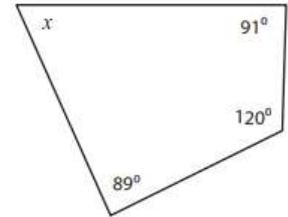
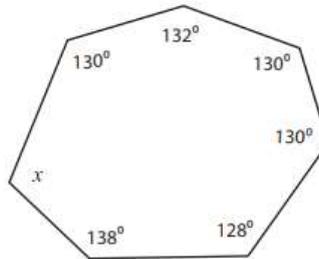
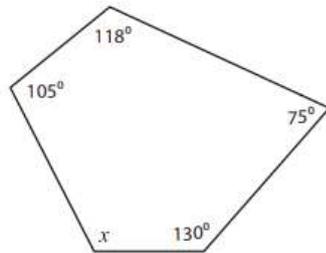
34. Calculate the area of the following shapes, leave your answer in terms of π



35. Calculate the shaded areas, round your answer to 3 s.f.



36. Find the missing angles



37. Complete the conversions below:

- a. $x \text{ cm}^2 = 500 \text{ mm}^2$ b. $y \text{ m}^2 = 45,200 \text{ cm}^2$
 c. $3 \text{ km}^2 = z \text{ cm}^2$ d. $450,000 \text{ m}^2 = 0.45 \text{ ???}$
 e. $\frac{1}{5} \text{ m}^2 = a \text{ cm}^2$ f. $\frac{2}{5} \text{ cm}^2 = b \text{ mm}^2$

38. Calculate the external angles for the regular shapes listed

- a) Pentagon b) Hexagon c)
 Octagon d) Nonagon e)
 Decagon

39. Round the following numbers to

- a) 3 s.f. b) 2 s.f. and c) 1 s.f.
 i) 4213 ii) 23.65 iii) 0.0465
 iv) 0.009231 v) 0.4054 vi) 0.07008

40. A football pitch is 110m by 65m and needs to be re-turfed. Turf comes in rolls of 20000 cm^2 . How many rolls of turf will be needed to cover the pitch?

41. Work out the following what 234.7kg is after:

- a. an increase of 24%
 b. a decrease of 5%
 c. an increase of 200%
 d. a decrease of $\frac{1}{2}\%$
 e. an increase of 73%
 f. a decrease of 89%

42. There is 23g of sugar in a 68g portion of breakfast cereal, what percentage of the cereal is sugar?

43. Mary buys 50 bottles of water for 32p each and sells them all for 50p each. What is the percentage profit she has made?

44. Tom took 30 sweets out of a bag; this was of 45% of the contents. How much was in the bag at the start?

45. A painting appreciates in value from £260 to £325. What is the percentage increase in value?

46. Henry bought a car for £7000 but then sold it for £5400 a few years later. What was his percentage loss?

47. Peter scored 24/60 in an English test and 28/68 in a maths test. Which one did he do better in?

48. Jane gets an increase of 3% to her salary, followed by another increase of 2.5%. What increase is this overall?

49. Who is travelling faster on average, a cyclist who travels 28km in 1.5 hours or a horse rider who travels 26000m in 1 hour and 15 minutes?

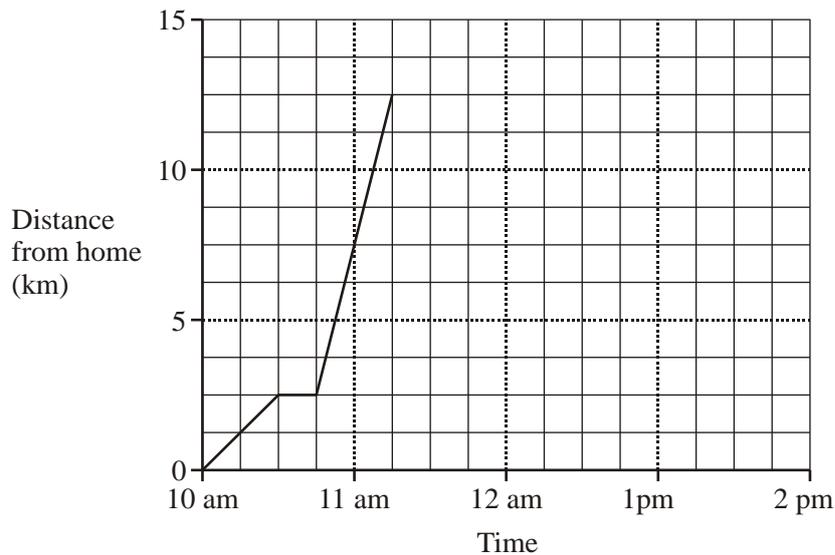
50. What average speed is a train travelling at if it leaves London at 9.43 and arrives at Glasgow at 15.15. It is

411 miles between Glasgow and London.

51. If I walk at a constant rate of 5mph, how far will I walk in 2 hours and 12 minutes?

53. Mr Smith leaves the home at 10 am to go to the shopping mall. He walks to the station where he catches a train. He gets off the train at the mall. The travel graph shows his journey.

52. How long will it take a car travelling at an average speed of 65mph to cover 221 miles?



After shopping Mr Smith goes home by taxi. The taxi leaves the mall at 1 pm and arrives at his home at 1.45 pm. Complete the travel graph. Calculate the average speed of the taxi.

54. Identify all the equivalent ratios and ratio values below:

10: 5	0.5	415:830
45: 60	75: 37.5	2
21: 3	7.5: 10	7

a) 48 into the ratio 3: 1	b) 300 into the ratio 5: 7
c) 95 into the ratio 28: 10	d) 840 in the ratio 3: 5: 6
e) 50,000 into the ratio 1: 1: 3	f) 1288 into the ratio 0.3: 2

55. For each of the pairs below state, with a reason, if they are equivalent:

a) 10: 5 & 5: 10	b) 3: 7 & 60: 140
c) 45: 60 & 15: 20	d) 4: 6: 12 & 2: 3: 6
e) 21: 3 & 36: 9	f) 4: 6: 3 & 4: 3: 6

56. Express these ratios in their simplest form:

a) £45: £80	b) 450g: 5kg
c) 13km: 500m	d) 22: 33: 121
e) 1m ² : 3,000cm ²	f) 0.5m ² : 1,000,000mm ²

57. In each case by drawing a suitable model, show how you can divide the number into the given ratio:

58. Ann and Betty share some seeds in the ratio 4:7. Betty gets 450 more seeds than Ann. How many seeds were there in total?

59. Xavier and Yannis are playing an online game together. The ratio of their scores is 3:11. Yannis has 912 points more than Xavier. What is his total score?

60. Ingrid, Janet and Katie share some Cumin in the ratio 5:7:3. Katie has 96g

- less than Ingrid. How much does Janet get?
61. A floor is covered in grey and orange tiles. The ratio grey to orange is 5:2. Each tile is 45cmx20cm. If the floor measures 18mx70m, how many orange tiles are there?
 62. An isosceles triangle has sides in the ratio 4:4:11. Given that the longest side is 44cm long, what is the perimeter of the triangle?
 63. Paul has $\frac{5}{6}$ as many marbles as Quincy. Quincy gives Paul 22 marbles and they now have the same number. How many marbles did Quincy start with?
 64. Ben has Red sweets and Green sweets in the ratio 6:5. He gives away some Red sweets and the ratio is now 3:5.
 - a. What fraction of his red sweets did Ben give away?
 - b. What fraction of his starting total of sweets did Ben keep?
 65. Jeff has three types of pens in his store. The ratio of Blue to Red pens is 4 : 5. The ratio of Red to Black pens is 7 : 10. What is the ratio of Blue to Black pens?
 66. The ratio of Apples to Pears in a market is 3 : 5. The ratio of Green Apples to Red Apples is 3 : 4. Given that there are 9 Green apples. How many pears are there?
 67. Steph and Chloe share sweets in the ratio 7 : 4. Steph has 45 more sweets than Chloe. How many sweets are there altogether?
 68. At a baseball game the ratio of home to away fans is 4 : 1
70% of the home fans are women
85% of the away fans are women
What percentage of people at the game are women?
 69. 7 machines can create 3.5 car engines in an hour. How many machines are needed to build in an hour:
 - a) 1 engine
 - b) 6 engines
 - c) 12 engines
 - d) 300 engines
 70. If it takes 5 men 2 hours to dig a hole, how long will it take 3 men?