Abronhill High School

Mathematics Department

Homework/Revision Booklet

Convert between 12 and 24-hour time

1. Change the following to 24 hour times :-

(a) 8·30 am	(b) 1·50 pm	(c) 4·20 pm	(d) 9·01 pm
(e) 6·10 am	(f) 9·45 pm	(g) 11·12 pm	(h) 12·10 pm
(i) 7·08 pm	(j) 11·59	(k) 11·59 am	(l) midnight
(m) Quarter past nine at night		(n) Half past two in the afternoon	
(o) Quarter to six in the evening		(p) Twelve minutes to midnight.	

2. Change the following to 12 hour times :-

(a) 0440	(b) 1610	(c) 2205	(d) 1910
(e) 1130	(f) 0010	(g) 1255	(h) 1010
(i) 1706	(j) 0101	(k) 2010	(l) 0000

Time Intervals

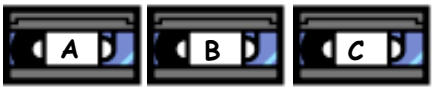
1. How long is it from :-

(a) 3·05 pm to 5·20 pm	(b) 5·15 am to 8·55 am	(c) 6·30 pm to 8·05 pm
(c) 9·50 pm to 11·15 pm	(d) 1430 to 1945	(e) 0950 to 1605
(f) 1442 to 2020	(g) Quarter to six in the morning until five past nine at night.	

2. Kay is not sure which video to watch.

   (a) If she starts to watch one of the videos at 8·35 pm, list the finishing time of each video.

   (b) Kay decides to watch all three videos. What time would the last video finish ?



A	B	C
2 hrs 40 mins	1 hr 25 mins	2 hrs 55 mins

3. New york is 5 hours behind our time (ie Glasgow time 6 pm → New York time 1 pm).

   An aeroplane leaves Glasgow for New York at 1·45 pm with a flight time of 6 hours 35 mins.

   What is the time in New York when the plane lands ?

Decimal Time

1. Round the following times to 1 decimal place :-

   (a) 8·16 secs (b) 15·05 secs (c) 20·97 secs (d) 0·709 secs

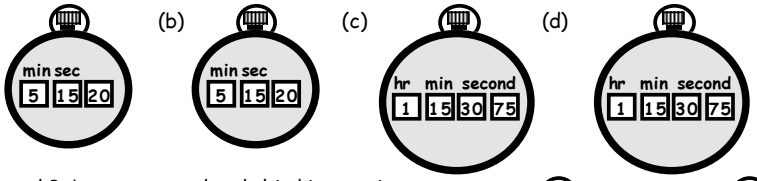
2. In a Formula 1 trial the following times were recorded;

   Jenson : 54·62 secs, Cooltad : 54·09 secs, Chewmaker : 54·1 secs, Hall : 54·3 secs.

   List the drivers in order, pole position (winner) first.

3. State the times shown in the following stopwatches :-

(a) (b) (c) (d)



4. Ben and Bob came second and third in a sprint.

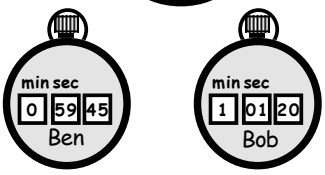
   (a) By how much did Ben beat Bob ?

   (b) James beat Bob by 1·5 secs.

   (i) What was James' time

   (ii) By how much did James win the race ?

   (c) Write your answer to (b), (ii) as a fraction in thousandths of a second.



Timetables

Here are the bus timetables for **"Stirling <—> John O'Groats"**.

Stirling <—> John O'Groats			
Stirling	leave	0955	2300
Perth	arrive	1050	2355
	leave	1050	midnight
Dunkeld	arrive	1120	0025
Pitlochry	arrive	noon	0105
	leave	1310	0120
Kingussie		1430	0240
Carrbridge		1508	0310
Inverness	arrive	1558	0405
	leave	1640	0405
John O'Groats	arrive	1800	0530

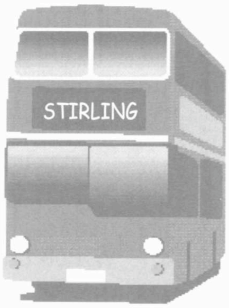
John O'Groats <—> Stirling			
John O'Groats	leave	1000	2200
Inverness		1140	2340
Carrbridge		1232	0032
Kingussie	arrive	1300	0105
	leave	1345	0110
Pitlochry		1425	0150
Dunkeld	arrive	1455	0220
	leave	1505	0220
Perth	arrive	1532	0251
	leave	1532	0315
Stirling	arrive	1610	0440

(a) How long does it take from Inverness to John O'Groats on each of the 0955 and the 2300 services from Stirling ?

(b) At what times do the buses leave Kingussie for Pitlochry ? (answer using a.m. or p.m.)

(c) Where will you have time for lunch on each of the **day time services** ? How long in each case ?

(d) On the **night time services** – where will you have time for a comfort stop and for how long in each case ?



(e) Which of the two evening service takes longer and by how much ?

(f) If you dislike travelling by bus, but had to undertake a journey from John O'Groats to Stirling, which bus would you choose to take and why ?

A plane leaves Edinburgh Airport at 2340 on Wednesday.
It touches down in Teneriffe at 0410 (British time) on Thursday.

How long did the flight take ?

British Airways flight BA447 left Gatwick Airport at 10·25 pm on Monday and arrived in New York at 5·10 pm (British time) on Tuesday morning.

(a) How long did the flight take ?

(b) New York is 5 hours **behind** Britain. What time (New York time) was it really when the plane touched down ?

Look at the T.V. programme listings and answer the following :-

BBC1

DAWN FRENCH: 9.00pm

6.00 **Breakfast** (T) 776062
9.00 **Kilroy** (T) 8715333
10.15 **City Hospital** (T) 5877791
11.00 **Big Strong Boys** (R) (T) 2284
11.30 **Real Rooms** (T) 3913
12.00 **Call My Bluff** (T) 55888
12.30 **Passport to the Sun** (T) 74401
1.00 **BBC News; Weather** (T) 48159
1.30 **Regional News; Weather** 63631028
1.45 **Neighbours** See 5.35pm for details (T) 51893468
2.10 **Diagnosis Murder** An arson attack ends in death (R) (T) 6923975
2.55 **Dragan Sgeul (Dragon Tales)** Fire-breathing fun for kids 5475371
CHILDREN'S
3.25 **Tweenies Songtime** (T) 3796081 **3.26 Tweenies** (T) 5956197 **3.45 Rugrats** (R) (T) 8610062 **3.55 SMart on the Road** (T) 6812062 **4.10 The Wild Thornberrys** (R) (T) 7803994 **4.35 The Next Big Thing** (T) 2831420 **5.00 Blue Peter** (T) 5099468 **5.20 Newsround Extra** (T) 7729352
5.35 **Neighbours** It's Toadie's last day at Stewart, Whitehead and Moore, and Flick is fed up with Matt's obsession with cars (R) (T) 763081

BBC2

6.00 **OU** 72468
CHILDREN'S
7.00 **Potsworth and Co** (R) (T) 1062994 **7.20 Arthur** (R) (T) 1854710 **7.45 Captain Abercromby** 2543888 **8.00 Pocket Dragon Adventures** (R) (T) 2911081 **8.15 Bill and Ben** (R) (T) 5514975 **8.25 Just So Stories** (R) (T) 5538555 **8.35 Postman Pat** (R) (T) 4000028 **8.50 Pingu** (R) 4867197 **9.00 Teletubbies** (R) (T) 9061994 **9.50 Playdays** (R) (T) 2579371 **10.10 Tweenies** 2787053
CHILDREN'S
10.50 **Hands Up!** (T) 2360555 **11.05 Numbertime** (T) 3019517 **11.20 Words and Pictures** (T) 3023710 **11.35 Watch** (T) 7553913 **11.50 Zig Zag** (T) 7530062 **12.10 Landmarks** (T) 4600791
12.30 **Working Lunch** The latest stories from the business world 76541
CHILDREN'S
1.00 **Bill and Ben** (R) (T) 39229401
1.10 **FILM: MOGAMBO** Lumbering jungle romance with Clark Gable. See Movies (T) 60018623
3.05 **Afoot Again in the Past** Gavin Stamp traces the Great Western Railway and Kirsty Wark examines Paddington Station (T) 5943623
3.20 **BBC News; Regional News; Weather** (T) 3786604
3.30 **Esther** The hostess chairs another round of topical debate (T) 25888
4.30 **Ready Steady Cook** Culinary duel in which two celebrity chefs compete to prepare a meal in only 20 minutes (T) 4473449
5.15 **The Weakest Link** Anne Robinson hosts the general knowledge quiz in which contestants answer

SCOTTISH

6.00 **GMTV** Kate Garraway and Eamonn Holmes present the final part of Child Car Seat Safety Week 2823642
9.25 **Trisha** Guests relate their stories in the studio discussion (T) 8660994
10.30 **This Morning** Popstars contestant Warren Stacey performs live and talks about what he's been up to in the last year. Plus Phil Vickery's cookery ideas for the weekend and the regular phone-in slot (T) 14623
12.00 **Family Fortunes** Two families compete for prizes, the £5000 jackpot and a new car (R) (T) 73284
12.30 **ITV News; Weather** (T) 4463791
1.10 **Scotland Today** (T) 51408178
1.40 **Oliver Twist** Fagin's attempt to set Oliver up as a criminal fails when the victim, Mr Brownlow, becomes the boy's benefactor (R) (T) 5707807
2.40 **Passport Quiz** Bryan Burnett asks the questions as three couples vie for a holiday in the sun (T) 5471555
3.10 **ITV News** (T) 3793994
3.15 **Scotland Today** (T) 9188807
CHILDREN'S
3.25 **Dog and Duck** (T) 3772401 **3.35 Kipper** (R) (T) 6836642 **3.45 Little Ghosts** (T) 8605130 **3.55 Cardcaptors** 2510438 **4.20 How 2** (R) (T) 7213826 **4.40 My Parents Are Aliens** (R) (T) 2823401
5.05 **Airline** Katrina anxiously prepares for her first check-up since the cancer operation, and football fever descends on Luton Airport prior to Manchester United's Champions League final (R) (T) 9039517
5.30 **Catchphrase** Nick Weir offers encouragement as contestants try to deduce everyday phrases and

(a) Which channel is showing the film "**Mogambo**" ?

(b) How long is the lunchtime showing of "**Neighbours**" ?

(c) "**GMTV**" lasts for how long ?

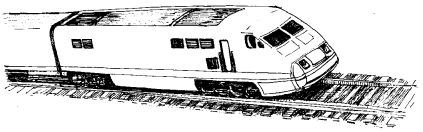
(d) I watch "**Passport Quiz**" on Scottish till the end of the programme, then switch to BBC1 for "**Dragan Sgeul**".
How much have I already missed of "**Dragan Sgeul**" ?

(e) I want to record "**Real Rooms**", "**Family Fortunes**", "**Working Lunch**", "**Bill & Ben**" and "**Scotland Today**" on a 2 hour tape.
Is this possible ? Explain !!

Calculating DISTANCE

1. Copy and complete the formula to calculate the distance travelled | D = ... x ... |

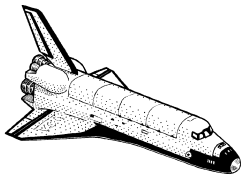
2. Use your formula to calculate each of the following distances :-
   (a) A car travelling at 40 km/hr for 3 hours.
   (b) A runner travelling at 9 m.p.h. for 2 hours.
   (c) A train travelling at 85 km/hr for 4 hours.
   (d) A jet travelling for 5 hours at a speed of 450 m.p.h.



3. A camel walks at 8 km/hr.
   How far would it travel in :-
   (a) 3 hours (b) 30 minutes (c) $\frac{1}{4}$ of an hour ?

4. (a) How far will Ellie jog at 14 km/hr if she runs for 45 minutes ?
   (b) How far will a car travel at 50 km/hr for 90 minutes ?

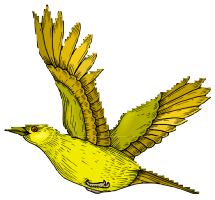
5. A spaceship travels at 3000 km/hr.
   How far will it travel in a day ?



Calculating Speed

1. Copy and complete the formula for calculating speed :- | $S = \frac{D}{....}$. |

2. Use your formula to calculate the following speeds :-
   (a) A car travels 180 kilometres and takes 3 hours.
   (b) A plane flying for 8 hours and travelling 3200 miles.
   (c) A bird flying 20 kilometres and taking 2 hours.



3. A train has to make a journey of 200 kilometres.
   How fast would it need to travel to complete the journey in :-
   (a) 2 hours (b) 4 hours (c) 5 hours (d) $\frac{1}{2}$ hour ?

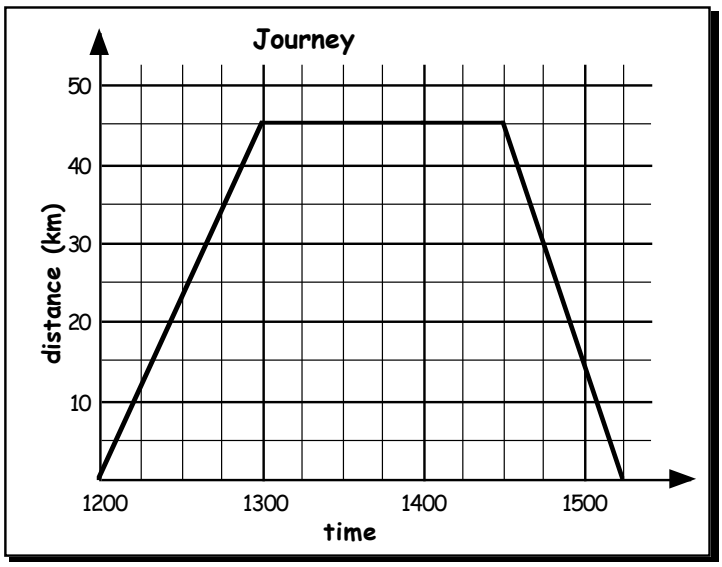
Calculating Time

1. Copy and complete the formula to calculate the distance travelled :- | $T = \frac{D}{....}$. |

2. Use your formula to calculate the time taken for each of the following :-
   (a) A car travels 240 kilometres at 60 km/hr.
   (b) A jet travels 2000 miles at a speed of 500 m.p.h.
   (c) A cat running at 4 metres/sec and covers 26 metres.

Distance-Time Graphs

1. The distance-time graph shows the journey Maggie made from her house to her favourite clothes shop and home again.



   (a) How long did the drive to the shop take ?

   (b) How far away is the shop from her house ?

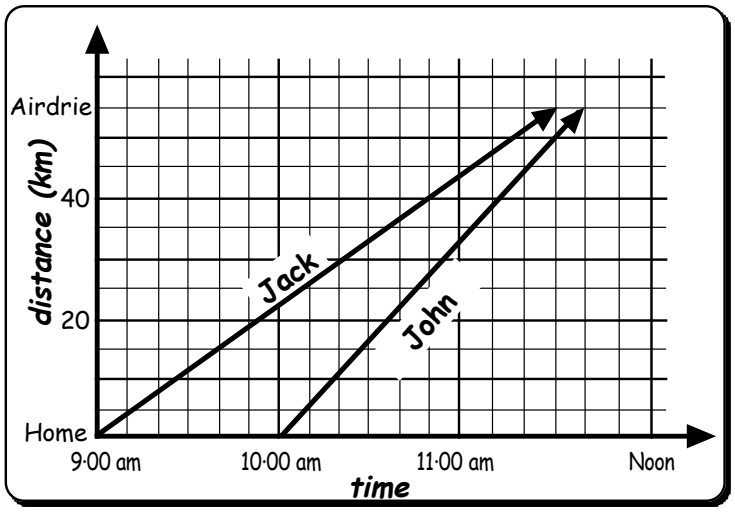
   (c) How long did she stay at the shop ?

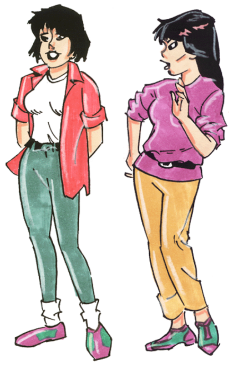
   (d) Calculate Maggie's speed :-

      (i) going to the shop.

      (ii) on the journey home.

2. On Saturday, sisters Jackie and Gill both leave from home and drive to Airdrie.





   (a) At what time did each of the sisters leave their house ?

   (b) How far away is Airdrie from their house ?

   (c) Who arrived in Airdrie first and by how many minutes ?

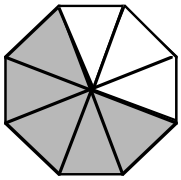
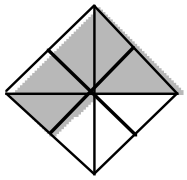
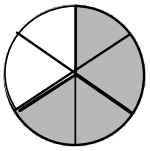
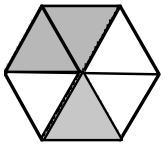
   (d) Calculate the speed of each sister.

   (e) Jackie left Airdrie at Noon and drove home at 25 km/hr. Gill drove home at 30 km/hr.

   If both sisters arrived home at the same time, when must Gill have left Airdrie (to the nearest minute) ?

Fractions/Percentages Revision

1. For each shape, say what fraction has been shaded :-

(a)  (b)  (c)  (d) 

2. Simplify each of the following fractions :-

(a) $\frac{7}{14}$ (b) $\frac{3}{12}$ (c) $\frac{14}{42}$ (d) $\frac{11}{88}$

(e) $\frac{12}{78}$ (f) $\frac{6}{84}$ (g) $\frac{25}{625}$ (h) $\frac{27}{126}$

3. Find :-

(a) $\frac{1}{3}$ of 66 (b) $\frac{3}{4}$ of 48 (c) $\frac{8}{9}$ of 27 (d) $\frac{5}{7}$ of 616

4. Write these as fractions in their simplest form :-

(a) 50% (b) 25% (c) 64% (d) 75%

(e) 20% (f) $66\frac{2}{3}\%$ (g) $33\frac{1}{3}\%$ (h) 12·5%

5. Change these fractions into percentages :-

(a) $\frac{7}{10}$ (b) $\frac{2}{5}$ (c) $\frac{1}{3}$ (d) $\frac{17}{20}$

(e) $\frac{24}{40}$ (f) $\frac{20}{30}$ (g) $\frac{225}{1000}$ (h) $\frac{3}{8}$

6. Calculate :-

(a) 20% of £75 (b) 65% of $840 (c) $12\frac{1}{2}\%$ of 808 kg

7. Kris had £120, ($\frac{3}{5}$ of his original holiday money). How much did Kris start with ?

Add/Subtract simple Fractions

1. Copy each of the following and simplify (where possible) :-

(a) $\frac{1}{5}+\frac{3}{5}$ (b) $\frac{2}{7}+\frac{1}{7}$ (c) $\frac{5}{8}-\frac{2}{8}$ (d) $\frac{8}{11}-\frac{5}{11}$

(e) $\frac{4}{5}-\frac{3}{5}$ (f) $\frac{7}{8}-\frac{5}{8}$ (g) $\frac{1}{8}+\frac{3}{8}$ (h) $\frac{4}{10}+\frac{6}{10}$

2. Copy each and simplify :-

(a) $4\frac{1}{2}+2\frac{1}{2}$ (b) $6\frac{1}{4}+1\frac{1}{4}$ (c) $4\frac{3}{4}+2\frac{3}{4}$ (d) $5\frac{7}{8}+\frac{5}{8}$

(e) $2\frac{3}{4}-2\frac{1}{4}$ (f) $7\frac{5}{8}-4\frac{3}{8}$ (g) $10\frac{7}{10}-5\frac{3}{10}$ (h) $2\frac{13}{15}-1\frac{8}{15}$

Multiply/Divide simple Fractions

Copy and complete each calculation (simplifying where possible) :-

(a) $\frac{2}{3} \times \frac{5}{7}$ (b) $\frac{1}{2} \times \frac{3}{5}$ (c) $\frac{3}{4} \times \frac{7}{8}$ (d) $\frac{5}{8} \times \frac{2}{3}$

(e) $\frac{7}{8} \times \frac{1}{14}$ (f) $\frac{2}{3} \times \frac{15}{16}$ (g) $\frac{7}{10} \times \frac{5}{14}$ (h) $\frac{5}{4} \times \frac{8}{15}$

Copy and complete each calculation (simplifying where possible) :-

(a) $\frac{3}{5} \div \frac{3}{4}$ (b) $\frac{4}{5} \div \frac{2}{15}$ (c) $\frac{1}{8} \div \frac{1}{4}$ (d) $\frac{4}{9} \div \frac{4}{15}$

(e) $\frac{7}{11} \div \frac{7}{22}$ (f) $\frac{8}{15} \div \frac{2}{3}$ (g) $\frac{11}{36} \div \frac{22}{24}$ (h) $\frac{10}{33} \div \frac{25}{36}$

Convert between Mixed Number and Top-Heavy Fractions

1. Change each of these top heavy fractions to mixed numbers :-

(a) $\frac{15}{2}$ (b) $\frac{16}{3}$ (c) $\frac{42}{5}$ (d) $\frac{91}{20}$

(e) $\frac{25}{4}$ (f) $\frac{63}{8}$ (g) $\frac{122}{11}$ (h) $\frac{629}{25}$

2. Change each of the following to a mixed number and simplify where possible :-

(a) $\frac{30}{4}$ (b) $\frac{25}{10}$ (c) $\frac{131}{5}$ (d) $\frac{100}{15}$

(e) $\frac{305}{25}$ (f) $\frac{78}{8}$ (g) $\frac{1005}{25}$ (h) $\frac{100005}{100}$

3. Change each of the following mixed numbers to a top heavy fraction :-

(a) $3\frac{1}{2}$ (b) $4\frac{1}{3}$ (c) $7\frac{3}{5}$ (d) $10\frac{5}{6}$

(e) $7\frac{8}{9}$ (f) $5\frac{11}{12}$ (g) $10\frac{1}{50}$ (h) $15\frac{8}{15}$

Percentage Calculations

1. Write down the simplest fraction for each of the following percentages :-

(a) 75% (b) 30% (c) 80% (d) 70%

(e) $33\frac{1}{3}\%$ (f) $66\frac{2}{3}\%$ (g) 40% (h) 30%

2. Find without a calculator :-

(a) 50% of £9 (b) $33\frac{1}{3}\%$ of 360 metres (c) 80% of 90 €

(d) 25% of 300p (e) 60% of 240 p (f) $66\frac{2}{3}\%$ of 121 kg

(g) 70% of 520 cm (h) 75% of 9600 kg (i) 75% of £440

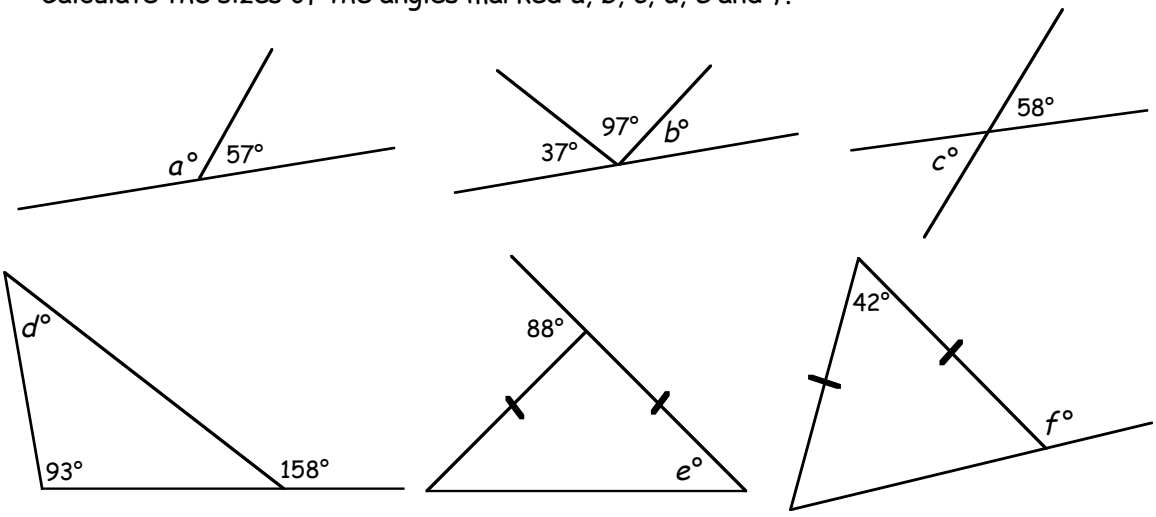
(j) 30% of 3100 km (k) 75% of £5 (l) $66\frac{2}{3}\%$ of 1·2 kg

3. Explain how you might (mentally) calculate 15% of £80.

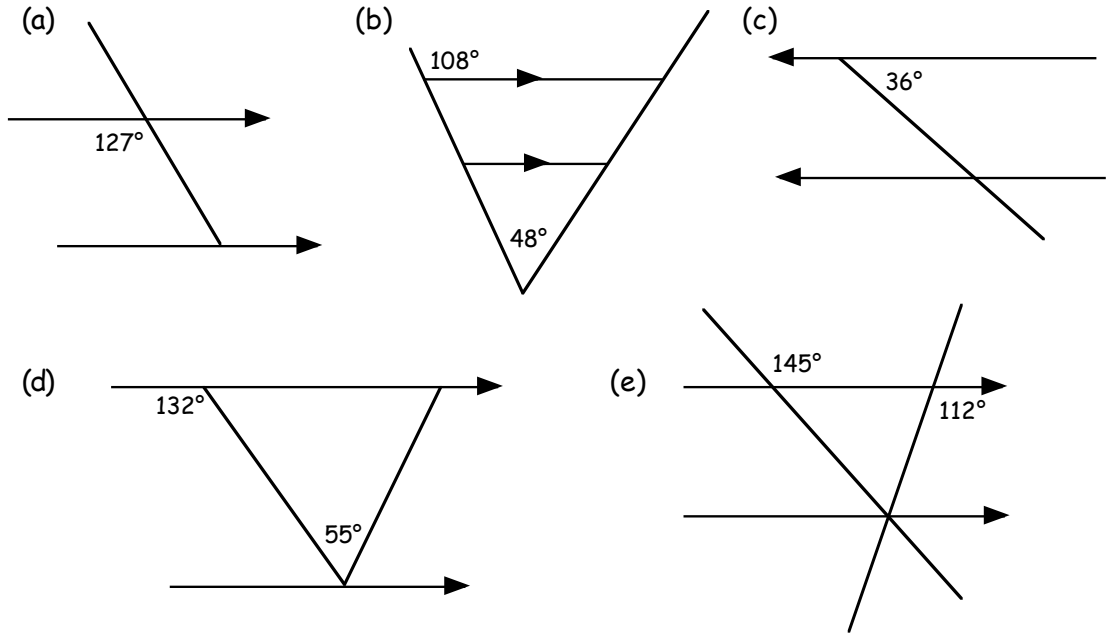
4. Explain how you might (mentally) calculate $17\frac{1}{2}\%$ of £80.

Angle Calculations

1. Calculate the sizes of the angles marked *a*, *b*, *c*, *d*, *e* and *f*.

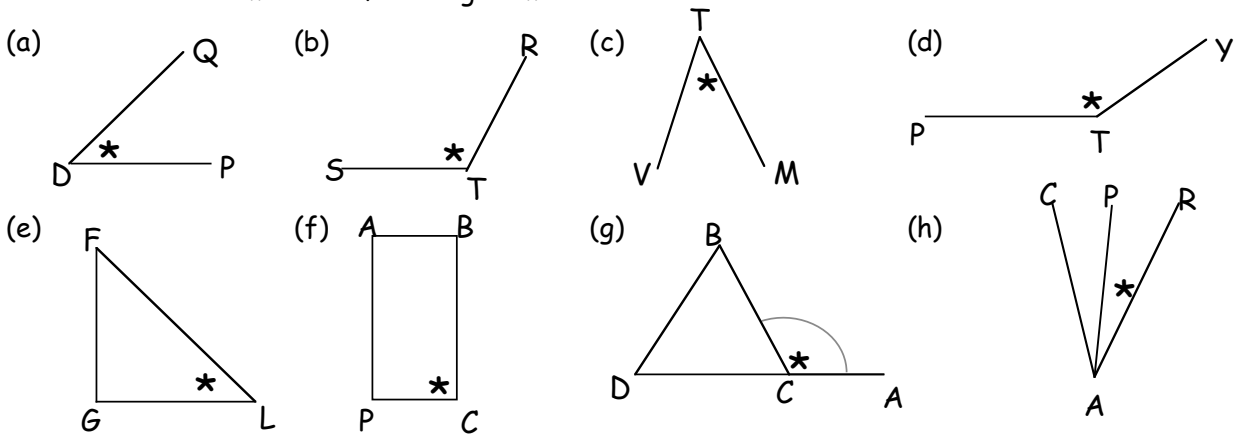


2. **COPY** each of the following and fill in the sizes of **all** the missing angles :-



Naming Angles

Use 3 letters to name each of the angles marked :-

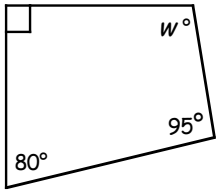


Angles in Quadrilaterals

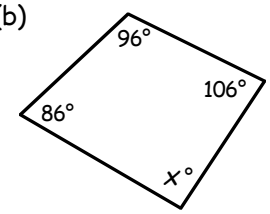
1. Copy and complete :- "The four angles in a quadrilateral always add up to ....."

2. Calculate the values of *w*, *x*, *y* and *z* in the following quadrilaterals :-

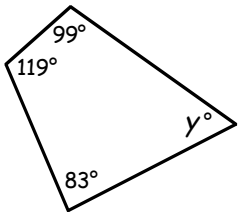
(a)



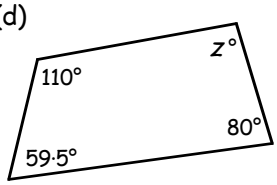
(b)



(c)

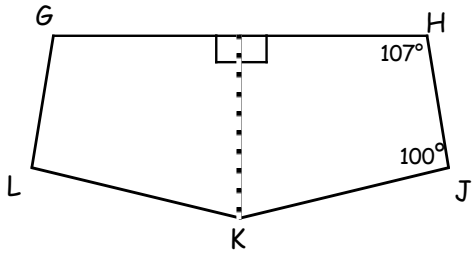


(d)



3. Two congruent quadrilaterals are used to create a shop sign.

   Calculate the size of angle JKL.



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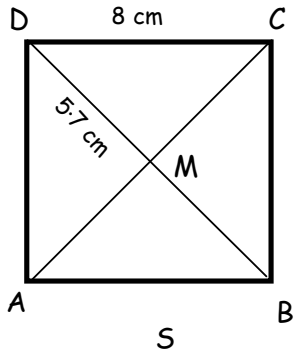
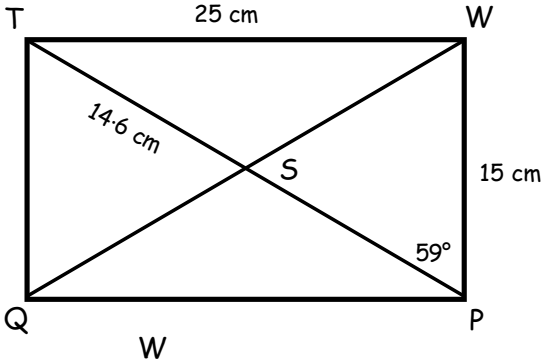
4. Sketch each of the following quadrilaterals and fill in the sizes of the missing angles:-

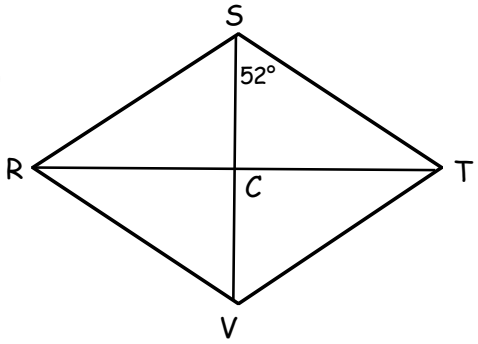
(a)



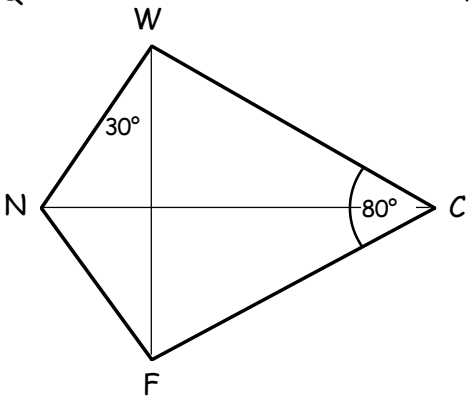
(b)



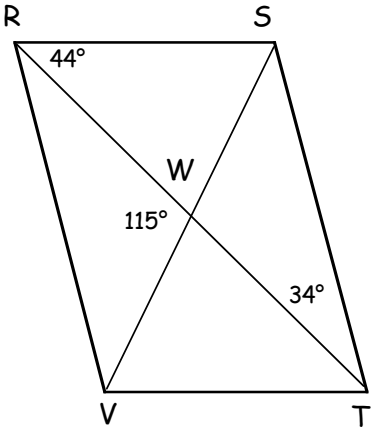
(c)



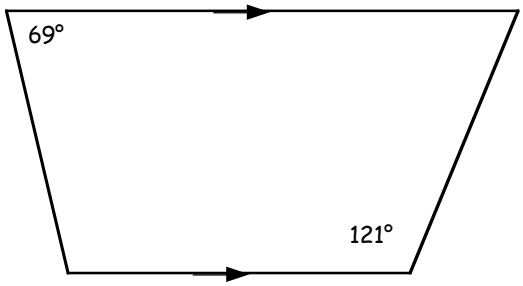
(d)



(e)

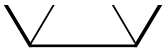


(f)



Interior/Exterior Angles of Polygons

1. What is the name of a regular polygon which has :-



(a) 5 sides (b) 6 sides (c) 7 sides

(d) 8 sides (e) 9 sides (f) 10 sides ?

2. The formula for finding the **interior** angles of a regular polygon, given the number of sides (n), is :-

interior angle = 180 – (360 ÷ n).

Use the formula to find the size of the interior angles of a regular :-

(a) pentagon (b) nonagon (c) 20 sided polygon.

3. The formula shown below is used to calculate the size of the exterior angles of a regular polygon.

exterior angle = 180° – **interior** angle

Use the above formula to calculate the size of the **exterior** angle of :-

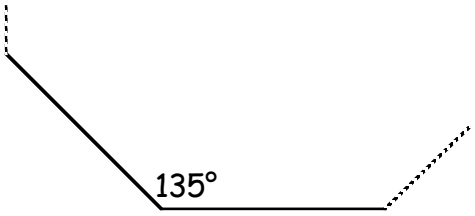
(a) a regular pentagon.

(b) a regular nonagon.

(c) a regular decagon.

4. (a) An interior angle of a regular polygon is found to be 135°.

What is the regular polygon called ?

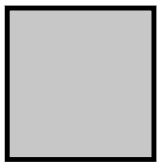
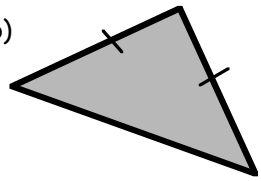


(b) An exterior angle of a regular polygon is found to be 60°.

What is the regular polygon called ?

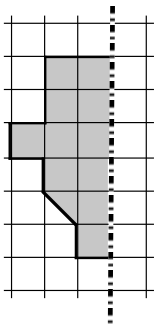
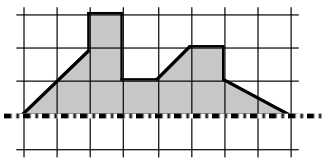
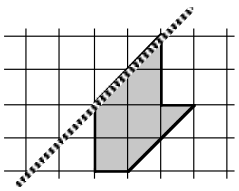
Symmetry

1. Copy each of these shapes and mark in all the lines of symmetry.

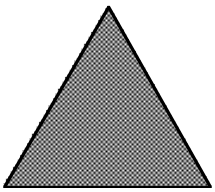
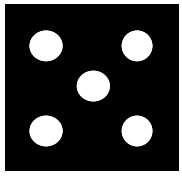
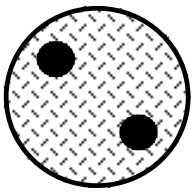
(a)  (b)  (c)  (d) 

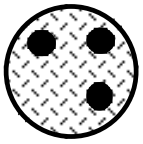
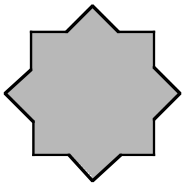
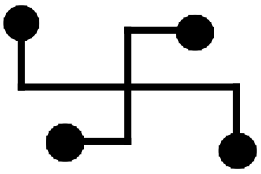
2. Write down all the capital letters of the alphabet that have exactly **two** lines of symmetry.

3. Copy each figure and complete so that the dotted line is a line of symmetry.

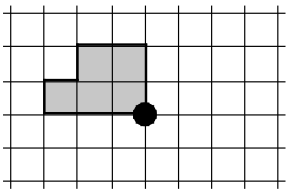
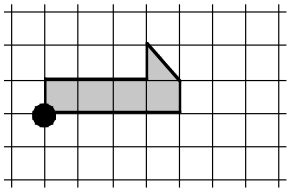
(a)  (b)  (c) 

4. Say which of these shapes have turn symmetry ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$), and state the "order" of rotational symmetry each time.

(a)  (b)  (c) 

(d)  (e)  (f) 

5. Copy each shape and rotate by 180° around the dot to produce a shape which has $\frac{1}{2}$ turn symmetry.

(a)  (b)  (c)