Task 1: Fill in the blanks. Leave answers as improper fractions where appropriate.

A	B	$A + B$	$A - B$	$A \times B$	$A \div B$	$B \div A$
$\dfrac{3}{5}$	$\dfrac{8}{15}$					
$\dfrac{3}{7}$	$\dfrac{8}{21}$					
$\dfrac{3}{11}$	$\dfrac{8}{33}$					
$\dfrac{3}{n}$						$\dfrac{8}{9}$
$\dfrac{5}{7}$		$\dfrac{19}{14}$				
$\dfrac{5}{8}$			$\dfrac{1}{16}$			
$\dfrac{5}{11}$				$\dfrac{45}{242}$		
$\dfrac{5}{n}$						$\dfrac{9}{10}$
		$\dfrac{12}{35}$	$\dfrac{2}{35}$			
				$\dfrac{8}{35}$	$\dfrac{14}{5}$	
		$\dfrac{78}{35}$		$\dfrac{27}{35}$		
$\dfrac{n^2}{5}$						$\dfrac{5}{7n}$

Task 2: Consider these fractions $\quad \dfrac{1}{6} \qquad \dfrac{1}{25} \qquad \dfrac{3}{5} \qquad \dfrac{3}{20} \qquad \dfrac{4}{15} \qquad \dfrac{5}{8}$

Order the fractions.	Using each fraction at most once, find a group that sum to as close to 1 as possible.

smallest LARGEST

Task 3: Find the mean, median and range for each of the following sets of numbers

1) a) $\quad \dfrac{1}{2} \quad \dfrac{1}{4} \quad 1$

Mean	Median	Range

b) $\quad \dfrac{1}{2} \quad \dfrac{1}{3} \quad 1$

Mean	Median	Range

c) $\quad \dfrac{1}{5} \quad -\dfrac{1}{2} \quad \dfrac{1}{10}$

Mean	Median	Range

d) $\quad \dfrac{1}{3} \quad \dfrac{1}{4} \quad -\dfrac{1}{12}$

Mean	Median	Range

e) $\quad \dfrac{4}{15} \quad -\dfrac{2}{5} \quad -\dfrac{1}{6}$

Mean	Median	Range

f) $\quad 2\dfrac{1}{2} \quad 5\dfrac{2}{3} \quad -2\dfrac{1}{6}$

Mean	Median	Range

2) a) $\quad \dfrac{2}{5} \quad \dfrac{9}{10} \quad \dfrac{1}{5} \quad \dfrac{1}{10}$

Mean	Median	Range

b) $\quad \dfrac{2}{3} \quad \dfrac{1}{3} \quad \dfrac{1}{2} \quad \dfrac{1}{6}$

Mean	Median	Range

c) $\quad 1\dfrac{1}{8} \quad \dfrac{1}{4} \quad \dfrac{1}{8} \quad \dfrac{1}{2}$

Mean	Median	Range

d) $\quad -\dfrac{2}{3} \quad -\dfrac{3}{4} \quad \dfrac{1}{3} \quad \dfrac{3}{4}$

Mean	Median	Range

e) $\quad 2\dfrac{2}{3} \quad -\dfrac{5}{7} \quad -1\dfrac{1}{7} \quad \dfrac{1}{3}$

Mean	Median	Range

f) $\quad -2\dfrac{1}{8} \quad -2\dfrac{5}{6} \quad 4\dfrac{5}{6} \quad 5\dfrac{5}{8}$

Mean	Median	Range

Task 4: Find the area and perimeter of each shape.

a)

1, 1, $\dfrac{3}{4}$, $\dfrac{1}{3}$

A =   P =

b)

$\dfrac{1}{2}$, $\dfrac{2}{3}$, $\dfrac{5}{6}$, $\dfrac{1}{2}$

A =   P =

c)

$\dfrac{4}{9}$, $\dfrac{5}{9}$, $\dfrac{1}{5}$, $\dfrac{1}{2}$

A =   P =

d)

$\dfrac{4}{5}$, $\dfrac{2}{3}$, $\dfrac{7}{18}$, $\dfrac{5}{6}$

A =   P =

e)

$\dfrac{1}{6}$, $\dfrac{3}{4}$, $\dfrac{1}{3}$, $\dfrac{3}{4}$

A =   P =

f)

$1\dfrac{3}{4}$, $\dfrac{1}{4}$, $\dfrac{3}{4}$, $\dfrac{5}{8}$

A =   P =

g)

$\dfrac{4}{5}$, $1\dfrac{1}{10}$, $\dfrac{9}{10}$, 1.4

A =   P =

h)

$\dfrac{4}{5}$, $\dfrac{1}{3}$, $\dfrac{7}{10}$, 0.68

A =   P =

i)

$\dfrac{1}{4}$, $\dfrac{7}{8}$, $\dfrac{3}{8}$, 0.75
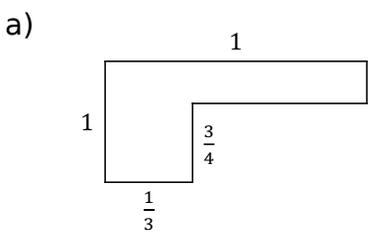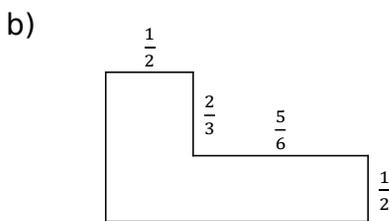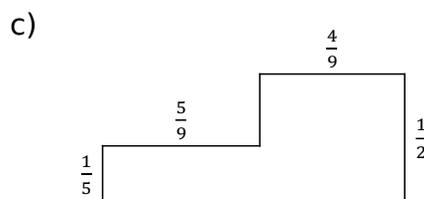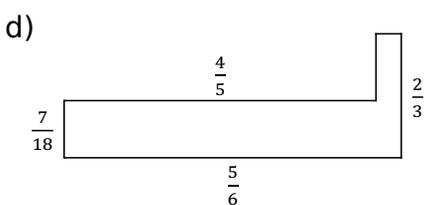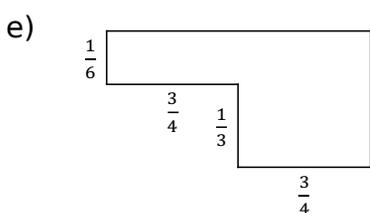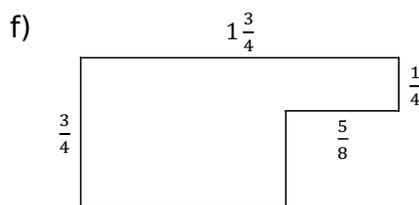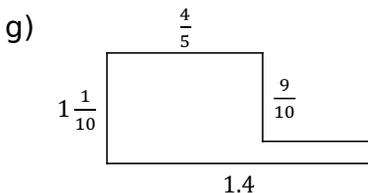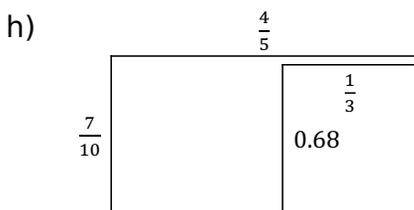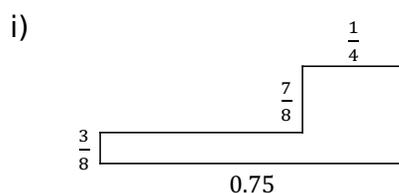
A =   P =

Task 5:

Omitted MathsPad Task

Task 6: Shade all the cells that round to 0.3 to 1 decimal place.
Complete the bottom row in a way that continues the pattern.

$\dfrac{1}{3}$	$\dfrac{1}{4}$	$\dfrac{1}{5}$	$\dfrac{7}{20}$	$\dfrac{6}{25}$
$\dfrac{46}{125}$	$\dfrac{44}{125}$	$\dfrac{42}{125}$	$\dfrac{32}{125}$	$\dfrac{31}{125}$
$\dfrac{35}{101}$	$\dfrac{35}{100}$	$\dfrac{35}{99}$	$\dfrac{25}{101}$	$\dfrac{25}{99}$
$\dfrac{1}{2}$	$\dfrac{2}{7}$	$\dfrac{7}{27}$	$\dfrac{27}{75}$	$\dfrac{75}{301}$

Task 7: Shade all the cells that round to 0.4 to 1 decimal place.

$\dfrac{1}{10} + \dfrac{1}{4}$	$\dfrac{1}{4} + \dfrac{1}{5}$	$\dfrac{1}{5} + \dfrac{2}{15}$	$\dfrac{2}{15} + \dfrac{1}{3}$	$\dfrac{1}{3} + \dfrac{1}{24}$
$5\dfrac{1}{8} - 4\dfrac{3}{4}$	$4\dfrac{3}{4} - \dfrac{13}{3}$	$\dfrac{13}{3} - 4$	$4 - \dfrac{71}{20}$	$\dfrac{71}{20} - 3\dfrac{11}{50}$
$\dfrac{11}{20} \times \dfrac{3}{5}$	$\dfrac{3}{5} \times \dfrac{3}{5}$	$\dfrac{3}{5} \times \dfrac{2}{3}$	$\dfrac{2}{3} \times \dfrac{1}{2}$	$\dfrac{1}{2} \times \dfrac{9}{10}$
$\dfrac{3}{4} \div \dfrac{5}{3}$	$\dfrac{5}{3} \div 3\dfrac{2}{3}$	$3\dfrac{2}{3} \div 10$	$10 \div 28\dfrac{4}{7}$	$28\dfrac{4}{7} \div 57\dfrac{1}{7}$

Task 8:　Solve each of the following equations

1) $\quad 0.2x + 5 = 8$	**7)** $\quad 0.002x + 50 = 80$	**13)** $\quad 0.2(x + 0.8) = 0.19$
2) $\quad 0.2x - 0.5 = 8$	**8)** $\quad 80x + 0.002 = 0.05$	**14)** $\quad 0.4(2x - 0.03) = 0.3$
3) $\quad 0.5x + 0.2 = 8$	**9)** $\quad 0.2x - 0.07 = 0.35$	**15)** $\quad 0.4(0.2x - 0.03) = 0.03$
4) $\quad 0.8x - 0.2 = 50$	**10)** $\quad 0.03x + 0.04 = 0.46$	**16)** $\quad 0.6(0.7x - 0.81) = 0.9$
5) $\quad 0.2x + 0.15 = 0.5x$	**11)** $\quad 9.7 - 0.07x = 1.3$	**17)** $\quad \frac{5x - 0.8}{0.2} = 3.5$
6) $\quad 2x + 0.8 = 2 - 0.5x$	**12)** $\quad 3.3 + 0.03x = 0.07x + 0.5$	**18)** $\quad \frac{0.9x - 0.04}{0.8} = 0.4$

Task 9:　Shade all the cells that round to 0.2 to 1 decimal place.
　　　　　Complete the bottom row in a way that continues the pattern.

$0.028 + 0.122$	$0.122 + 0.128$	$0.128 + 0.018$	$0.18 + 0.06$	$0.06 + 0.08$
$4 - 3.883$	$3.883 - 3.712$	$3.712 - 3.001$	$3.001 - 1.831$	$1.831 - 1.654$
0.6×0.4	0.4×0.7	0.7×0.2	0.2×0.95	0.95×0.28
$0.006 \div 0.02$	$0.02 \div 0.125$	$0.125 \div 0.5$	$0.5 \div 1.6$	$1.6 \div 8$

Task 10: Converting from a fraction to a recurring decimal

*Jo has answered this question **correctly**.* **Q:** Write $\frac{5}{12}$ as a recurring decimal. **A:** $$0.41666...$$ $$12\overline{)5.00000}$$ $$\frac{5}{12} = 0.41\dot{6}$$	**1:** Use Jo's answer to write the following as decimals a) $\frac{11}{12}$ b) $\frac{37}{60}$ c) $\frac{1}{12}$
Your turn **Q:** Write $\frac{4}{15}$ as a recurring decimal. **A:**	**2:** Divide the following into recurring and terminating (non-recurring) decimals. What do you notice?

$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	Recurring
$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{7}$	
$\frac{1}{8}$	$\frac{1}{9}$	$\frac{1}{10}$	Terminating
$\frac{1}{11}$	$\frac{1}{12}$	$\frac{1}{15}$	

Task 11: Converting from a recurring decimal to a fraction

*Sam has answered this question **correctly**.* **Q:** Using algebra, convert $0.\dot{3}\dot{6}$ to a fraction. **A:** $$x = 0.363636...$$ $$100x = 36.363636...$$ $$99x = 36$$ $$x = \frac{36}{99} = \frac{4}{11}$$	**1:** Explain the benefit of Sam multiplying by 100.
	2: Use Sam's answer to write the following as fractions a) $0.\dot{7}\dot{2}$ b) $0.\dot{3}\dot{7}$ c) $0.8\dot{6}\dot{3}$
Your turn **Q:** Using algebra, convert $0.\dot{5}\dot{7}$ to a fraction. **A:**	**3:** Using algebra, convert $0.\dot{9}$ to a fraction.

Task 12: Using algebra, convert each of the following to fractions.

a) $0.\dot{4}\dot{1}$	b) $0.\dot{4}$	c) $0.\dot{4}1\dot{2}$
d) $0.0\dot{4}1\dot{2}$	e) $0.3\dot{4}1\dot{2}$	f) $0.\dot{1}42857\dot{7}$

Task 14: Prove each of the following.

$0.\dot{1} \times 0.\dot{2}\dot{7} = \frac{1}{33}$	$0.\dot{5} \times 0.\dot{8}\dot{1} = \frac{5}{11}$	$0.\dot{1}\dot{8} \div 0.\dot{4} = \frac{9}{22}$
$0.\dot{8} \div 0.\dot{7}\dot{2} = 1\frac{2}{9}$	$0.1\dot{2}\dot{6} \div 0.\dot{2} = \frac{5}{8}$	$0.19\dot{4} \div 0.\dot{4} = \frac{7}{16}$

Task 15: Calculate each of the following as a fraction.

$2 \times 0.\dot{4}\dot{5}$	$5.5 \times 0.\dot{1}\dot{7}$	$\left(0.69\dot{4}\right)^{\frac{1}{2}}$
$1.5 \times 0.5\dot{3}$	$0.25 \times \left(0.\dot{1}\right)^{-\frac{1}{2}}$	$\left(0.\dot{2}9\dot{6}\right)^{\frac{1}{3}}$

Task 16: Find the length of the missing side as a fraction in its simplest form.
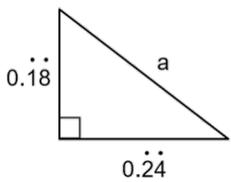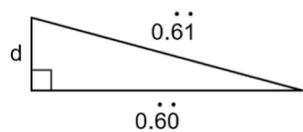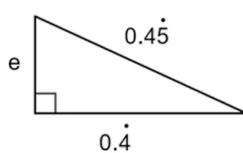

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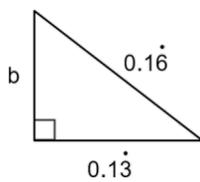
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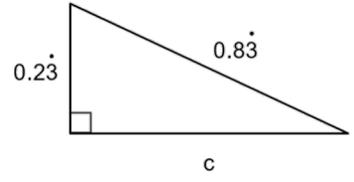
c =

d =

e =
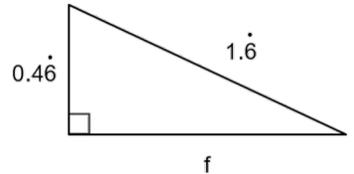
f =

g =
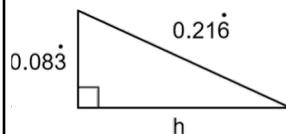
h =
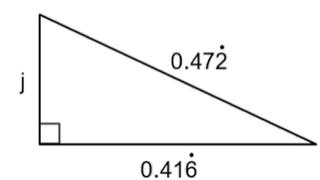
j =

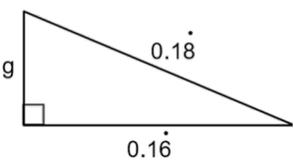**Task 17:** Fill in the gaps, labelling the Upper and Lower bounds on the number line.

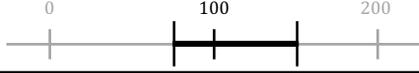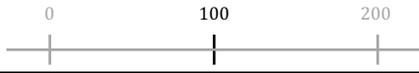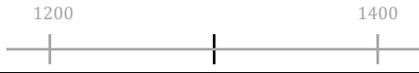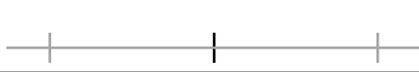| Rounded Value	Rounding Method	Number Line	Error Interval
300	Nearest hundred	200 250 300 350 400	$250 \le x < 350$
300	Nearest ten	200 300 400	
300	Nearest whole number	200 300 400	
300	1 significant figure	200 300 400	
100	1 significant figure	0 100 200	
100	2 significant figures	0 100 200	
	2 significant figures	1200 1400	$1250 \le x < 1350$
			$3099.5 \le x < 3100.5$
	2 decimal places		$\le x < 0.315$
			$0.3095 \le x <$
			$0.05 \le x < 0.15$
			$0.095 \le x < 0.15$
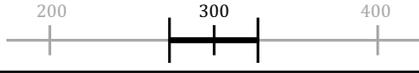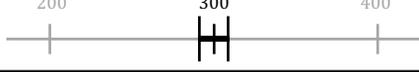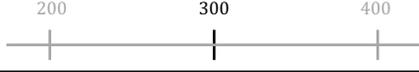
Task 18: Find the Upper and Lower bounds of each of the following expressions, where:
$x = 3.5$ (1 decimal place), $y = 27$ (2 significant figures), $z = 30$ (nearest ten).
Give your answers to 4 significant figures.

Expression	Lower Bound	Upper Bound	Expression	Lower Bound	Upper Bound
$x + y$			15% of x		
$y - x$			$\frac{2}{7}$ of x		
$\frac{y}{x}$			The range of x, y and z		
$\frac{1}{x} + y$			The median of x, y and z		
xy			The mean of x, y and z		
$\frac{y-x}{z}$				51.50	62.50

Task 19: Bounds Questions

1) The height of a tree is 12 metres, correct to the nearest metre. Write the error interval.	$\leq h <$
2) The length of a table is 110 cm to the nearest cm. Write the error interval.	$\leq l <$
3) To the nearest pound, Jon has £9. To the nearest 50p, Ellie has £6.50. Work out the maximum and minimum possible total amount of money.	Min = Max =

4) The length of each side of a regular pentagon is 8.4 cm to 1 decimal place.
    a)   Find the error interval for the length of one side.
    b)   Find the error interval for the perimeter.
	$\leq l <$
	
	 $\leq P <$

5) A tank is a cuboid measuring 50 cm by 35 cm by 20 cm. All lengths are to the nearest centimetre. A container has a capacity of exactly 34 litres. 1 litre = 1000 cm^3. Can you tell which has the larger capacity?	Yes / No because…
6) The length of a roll of ribbon is 30 metres, correct to the nearest half-metre. A piece of length 5.8 metres, correct to the nearest 10 cm, is cut from the roll. Work out the maximum and minimum possible length of ribbon left on the roll.	Min = Max =

7) a) The length of a pipe is 6 metres to the nearest metre.
       Complete the error interval for the length of the pipe.
    b) The length of a different pipe is 4 metres to the nearest metre.
       Olly says, "The total length of the two pipes is 11 metres, to the nearest
       metre." Give an example to show that he could be correct.
	$\leq l <$
	 E.g.

8) A lift is safe to use when the total mass of people is 450 kg or less. Ben and some other people are in the lift. Their total mass is 525 kg to the nearest 5 kg. Ben gets out. He has a mass of 78 kg to the nearest kg. Is the lift now safe to use?	Yes / No because…
9) An empty container has a capacity of 80 000 litres, to 1 significant figure. Mel pours in 7400 litres of water, to 2 significant figures. She says, "I have filled more than 10% of the container." Could she be correct?	Yes / No because…
10) $x = 400$ to 1 significant figure. $y = 25$ to 2 significant figures. Work out the maximum integer value of $\frac{x}{y}$	

Task 20: Give the error interval for each of the following **truncations**.

1. 1 (to the unit)	**2.** 67 (to the unit)	**3.** 380 (to the tens)
4. 5400 (to the hundreds)	**5.** 10000 (to the hundreds)	**6.** 56.7 (to 1 d.p.)
7. 0.45 (to 2 d.p.)	**8.** 10.300 (to 3 d.p.)	**9.** [ ] **(to** **)** $99\,000 \leq x < 100\,000$

Task 21: For each equation, find the upper and lower bounds for x

$2x + 7 = a$ $a = 23$, rounded to the nearest whole number	$2x + b = 7$ $b = 2.3$, rounded to one decimal place
$cx - 7 = 8$ $c = 2$, rounded to one significant figure	$dx + e = 8$ $d = 2$, rounded to one significant figure $e = 3.7$, rounded to one decimal place
$fx + 8 = g$ $f = 10$, rounded to one significant figure $g = 55$, rounded to two significant figures	$hx + i = j$ $h = 2$, $i = 1$, $j = 3$ all rounded to one s.f.

Task 21: Bounds in the media

newspapers regularly approximate numbers
what is the smallest and largest you think the actual numbers could have been?

(1) a man received £500 for unfair dismissal

(2) attackers stole £35 in cash

(3) the air ambulance took 20 minutes

(4) someone survived a 400 ft. fall into snow at Morte Base

(5) "I knew Jean Kent for 50 years"

(6) a salary of £24K

(7) the collision happened around 2.30 a.m.

(8) the Jaguar factory will create 700 jobs

(9) 33 held in a 1000 person EU protest in the Ukraine

(10) rowers embark on 3000 mile Atlantic charity bid

(11) appeal has raised £34,500

(12) unemployment is currently around 2.5 million

(13) average daily sales of three quarters of a million

(14) a £1.7M visitor centre scheme

(15) Margaret Thatcher had a £12 million house in a tax haven

(16) the US Government agrees to settle a $50 million lawsuit

(17) in 1982 New Zealand had 70 million sheep and 3.2 million people

(18) the estimated 25,000 polar bear population are a species of special concern

(19) £200,000 car vandalism spree

(20) 25,000 waiting list for social housing