Patterns

1. a. How many tiles does it take to make the n-th pattern? Explain.

(handwritten) $3n + 4$
3 groups of n and 4 on the corners

n=1   n=2   n=3   n=4
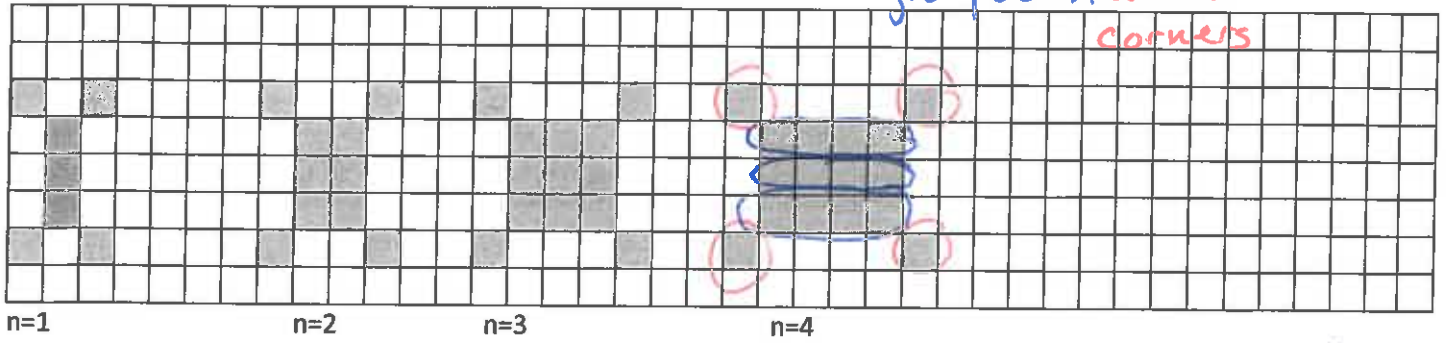
b. What is the biggest pattern you can make if you have T tiles?

(handwritten) $3n + 4 = T$
$3n = T - 4$
$n = \dfrac{T-4}{3}$. If you have a remainder when dividing then don't use it: you don't have enough for the next one

2. How many toothpicks does it take to make the n-th pattern? Explain.

n=1   n=2   n=3   n=4

b. What is the first pattern that uses at least T toothpicks?

Problem types and difficulty

(handwritten: Change over time / No change, easy, add more, hard)

Add To or Join Result Unknown	Add To or Join Change Unknown	Add To or Join Start Unknown
Take From or Separate Result Unknown	Take From or Separate Change Unknown	Take From or Separate Start Unknown
Part-Part-Whole, Whole Unknown	Part-Part-Whole, Part Unknown	Put Together/Take Apart Both Addends Unknown
Compare, Difference Unknown	Compare, Compared Quantity Unknown	Compare, Referent Unknown

(handwritten) Sam has 5 more than Kyle   referent   ★ hardest of all
harder

Problems to make bar diagrams for

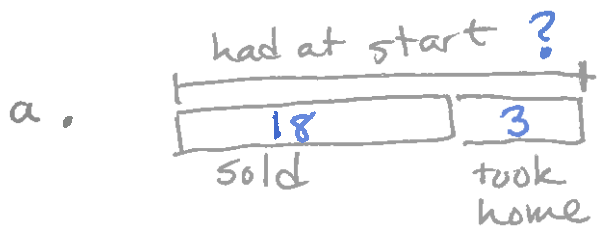|			
a	Sarah sold 18 brownies at the bake sale. She had 3 brownies left to take home at the end. How many brownies did she take to the bake sale?	**b**	Mark has $23. He has $14 less than Alice. How much does Alice have?
c	A pack of juice boxes has 8 boxes in it. How many juice boxes are in 6 packs?	**d**	6 friends share 42 candy bars. How many candy bars does each friend get?
e	A snail crawls 4 feet in an hour. How long does it take for the snail to go 20 feet?		

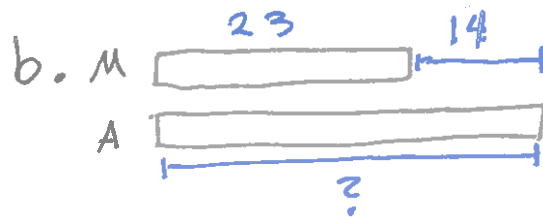Shapes: Make a big Venn diagram for all of the special quadrilaterals

Show different ways to do 47 + 25 and 64 − 18
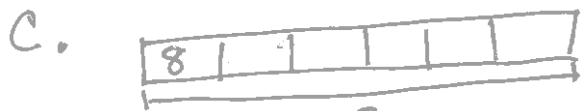
Explain the commutative and distributive laws

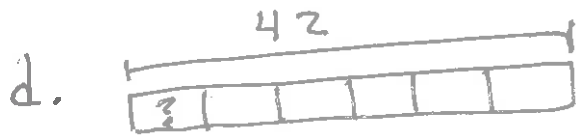Solve 1729 ÷ 7 using scaffolding division and a tape diagram.

a.

had at start ?

| 18 | 3 |
| sold | took home |

$18 + 3 = ?$

b. M

23   14

A

?

$23 + 14 = ?$

c.

| 8 | | | | |

?

$6 \times 8 = ?$

d.

42

| ? | | | | | |

$42 \div 6 = ?$
$6 \times \square = 42$

e.

| 4 | ? |

20

?

| 4 | ... | 4 |

20

$20 \div 4 = ?$

1hr   ?

4ft   20ft

$4 \times \square = 20$

Quadrilaterals: Square
                   Trapezoid
                   Kite
                   Rectangle
                   Rhombus
                   Parallelogram

parallelograms

Rectangle

kite

Rhombus

Square

Q

P

K

Trapezoid
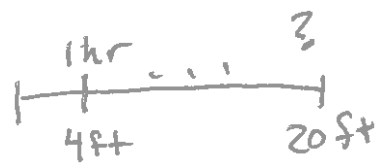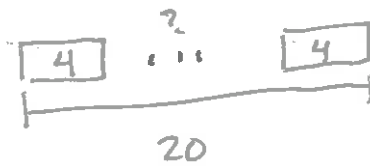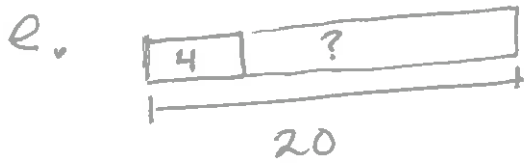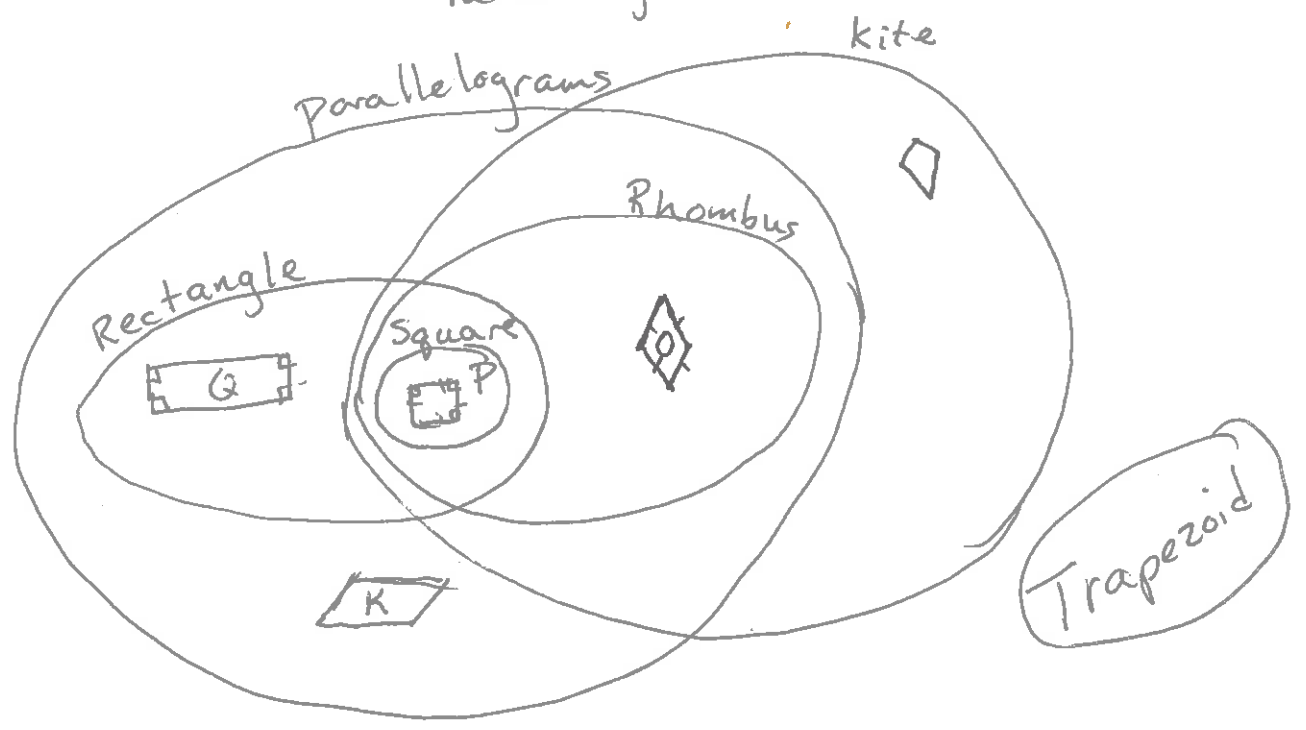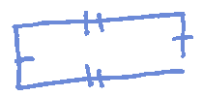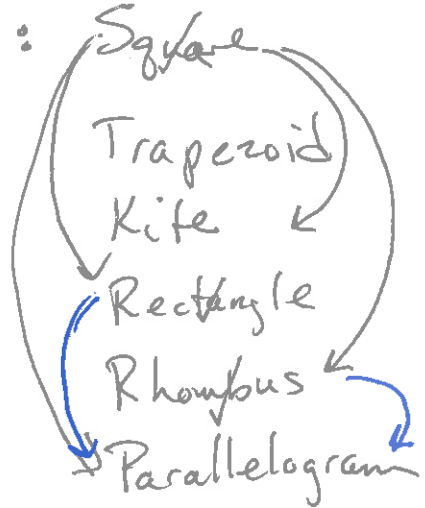
```
        247
    7 ) 1729
        700     100
       ------
        1029
         700    100
        ------
         329
         280     40
        ------
          49
          49      7
        ------
               247
```

100	100	100	100	100	100	100
100	100	100	100	---	---	---
40	40	40	40	---	---	---
7	7	7	---			