



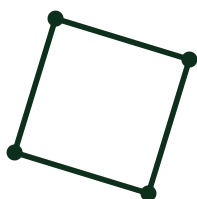
Roots of Reason

Sorting Shapes by Their Lines

Name _____ Date _____ Correct _____ / 24

1 Mark what you measure. *Each shape is turned, so no side lines up with the edge of the page.*

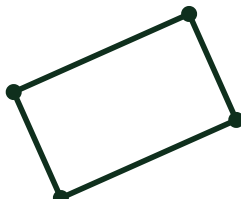
For each shape, count the pairs of sides that run the same way and never meet, then count the corners that are right angles. Use a folded paper corner. Do not guess from how it looks.



1. (a)

parallel pairs _____

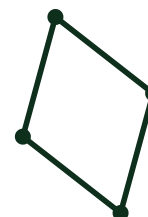
right angles _____



2. (b)

parallel pairs _____

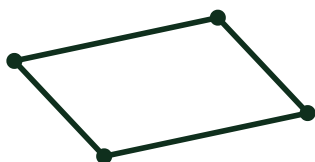
right angles _____



3. (c)

parallel pairs _____

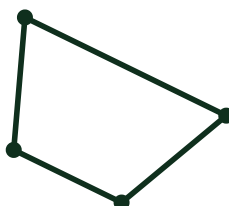
right angles _____



4. (d)

parallel pairs _____

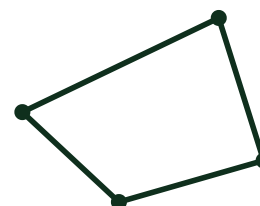
right angles _____



5. (e)

parallel pairs _____

right angles _____



6. (f)

parallel pairs _____

right angles _____

7. Two of the six have two pairs of parallel sides and no right angle at all. Which two letters?

_____ and _____

Roots of Reason

Name _____ Date _____

2 Every name that fits. *A shape can have more than one name.*

Use the marks you made on page 1, not the pictures. A shape belongs to a name whenever it meets that name's rule, even if a closer name also fits.

quadrilateral four straight sides **parallelogram** two pairs parallel **rectangle** four right angles **rhombus** four sides equal
square four right angles and four sides equal

shape	quadrilateral	parallelogram	rectangle	rhombus	square
8. (a)					
9. (b)					
10. (c)					
11. (d)					
12. (e)					
13. (f)					

14. Every square is a rectangle.

☐ true

☐ false

15. Every rectangle is a square.

☐ true

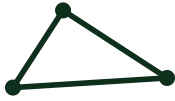
☐ false

16. One of the two statements above is true and the other is false. Use a shape from page 1 to show why the false one is false.

Roots of Reason

Name _____ Date _____

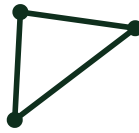
3 Which ones are right triangles? *Check every angle, not only the one that looks like a right angle.*



17. (g) right triangle?

yes

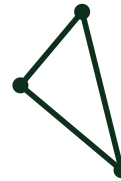
no



18. (h) right triangle?

yes

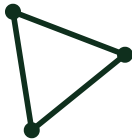
no



19. (i) right triangle?

yes

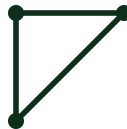
no



20. (j) right triangle?

yes

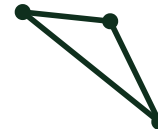
no



21. (k) right triangle?

yes

no



22. (l) right triangle?

yes

no

23. One of the six has an angle that is close to a right angle but is not one. Which letter, and how did you check?

24. A classmate says (k) is the only right triangle because it is the only one sitting flat. Say what is wrong with that.



Roots of Reason

Sorting Shapes by Their Lines

Mark what you measure

Written as parallel pairs, then right angles. 1. *2, 4* 2. *2, 4* 3. *2, 0* 4. *2, 0* 5. *1, 0* 6. *0, 0*

7. *c and d*. Two pairs of parallel sides do not bring right angles with them, which is the whole of what separates a parallelogram from a rectangle.

Every name that fits

8. (a) *all five names* 9. (b) *quadrilateral, parallelogram, rectangle*

10. (c) *quadrilateral, parallelogram, rhombus* 11. (d) *quadrilateral, parallelogram*

12. (e) *quadrilateral* 13. (f) *quadrilateral*. Shape a is the only one that fills every column.

14. *true* 15. *false* 16. Shape b has four right angles and its sides are not all equal, so it is a rectangle and not a square.

Which ones are right triangles

17. (g) *yes*, 90, 36.6, 53.4 18. (h) *no*, 85, 45.3, 49.7 19. (i) *yes*, 90, 54, 36

20. (j) *no*, 60, 60, 60 21. (k) *yes*, 90, 45, 45 22. (l) *no*, 122, 25.2, 32.8

23. *h*. The folded corner shows it: laid into that corner it leaves a small gap, so the angle is less than a right angle.

24. Three of the six are right, and (g) and (i) are turned. Sitting flat is a fact about the page, not about the corner.

Mark page 2 by rows, not by names. A student who has ticked exactly one box per shape has answered every row wrongly in the same way, and it will read as five near misses when the cause is one wrong idea. Shape e has one pair of parallel sides and no name beyond quadrilateral is asked for it, because the two definitions of trapezoid in circulation disagree about shapes c and d.