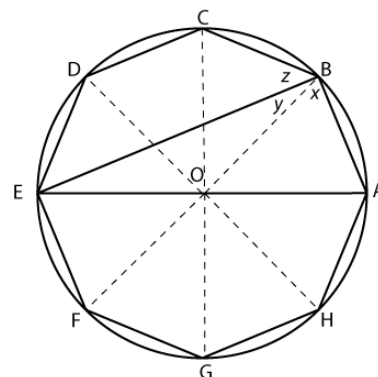


# Grade 9

## EXTRA CHALLENGES - SET VII

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- In the diagram, what are the measures of the angles  $x$ ,  $y$  and  $z$  in the following regular octagon.
- Glenn, Kevin, and Brad shared a paper route equally. All of Kevin's papers were delivered to an apartment building, so he finished quickly and helped Brad by delivering the last 8 of his papers. Kevin figured out that he had delivered 40% of the total number of papers. How many papers did Glenn deliver?



- The Timbuktu post office has only  $3^c$  and  $7^c$  stamps having run out of all other denominations. What are the six amounts of postage that cannot be created? How do you know there are only 6?
- Use the fact that a ream of 500 sheets of paper is about 5 cm thick.
  - What is the thickness of a single sheet of paper after being folded in half 12 times?
  - Compare the thickness of a piece of paper folded in half three times to any original sheet of paper.

### Did You Know?

Britney Gallivan set a world record in January 2002 by folding a sheet of paper 12 times, disproving earlier theories that a piece of paper could only be folded 7 times. She proved mathematically that 12 folds is the physical limit and paper cannot be folded further. She was only in grade 11! The piece of paper in the picture has been folded 11 times.



- A watch company makes two types of watches. There is such a demand the company cannot keep up with orders. The profit on each digital watch sold is \$120. The profit on each analog watch sold is \$150 per watch. However, due to limitations on the manufacturing equipment the production ratio of digital to analog watches has to be 5 : 3. How many watches of each type must be produced to make at least \$75 000 profit?

6. Ashley, Betty, Cassandra, Diana, and Emma are 14, 15, 16, 17, and 18 years old, but not necessarily in that order. Each girl is involved in an extracurricular activity, but no two girls are in the same club. The activities are yearbook, band, photography, environmental and art club. Use the information to determine the age of each girl and what activity they participate in.
- Ashley is two years younger than the girl in yearbook and the girl in band is one year younger than Betty.
  - Cassandra is younger than the girl in the photography club.
  - Diana is the same number of years older than Ashley as Emma is older than another girl.
  - The girl in yearbook is two years younger than Betty.
  - Cassandra is younger than Diana.
  - The girl in the environmental club is younger than the girl in the art club.

	18	17	16	15	14	Yearbook	Band	Photo Club	Env. Club	Art Club
Ashley										
Betty										
Cassandra										
Diana										
Emma										
Yearbook										
Band										
Photo Club										
Env. Club										
Art Club										

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