Similar Triangles

### JV Practice 2/9/20
Lucas Jia / Matthew Shi

1 Warm-up Questions

1. (AHSME 1995) In $\triangle$ ABC, $\angle$ C $= 90$ °,AC $= 6$ and BC $= 8$. Points D and E are on AB and BC, respectively, and $\angle$ BED $= 90°$. If DE $= 4$, what is the length of BD?

2. $\triangle$ ABC has AB $= 12$, AC $= 13$, and BC $= 15$. Points X and Y are placed on AB and AC respectively such that $\angle AXY = \angle CB$. If XY $= 6$, what is AX + AY ?

3. Review Law of Sines and Angle Bisector Theorem.

2 Similar Triangles, Adding Lines

1. (BmMT 2019) In triangle ABC, $\angle$ ABC $= 3\angle ACB$. If AB $= 4$ and AC $= 5$, compute the length of BC.
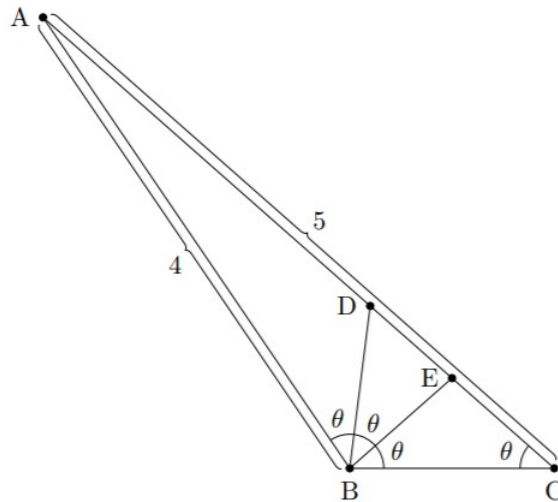
2. (Math League HS 1981-1982). The area of square ABCD is 1. As illustrated at the right, diagonal AC is extended its own length to point E. How long is BE?
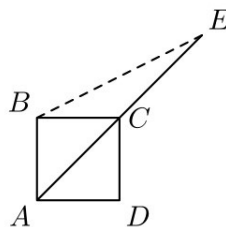
3   Sample Problems

1. (AMC 10A 2002). Points A, B, C, D, E, and F lie, in that order, on AF, dividing it into five segments, each of length 1. Point G is not on line AF. Point H lies on GD, and point J lies on GF. The line segments HC, JE, and AG are parallel. Find HC/JE.
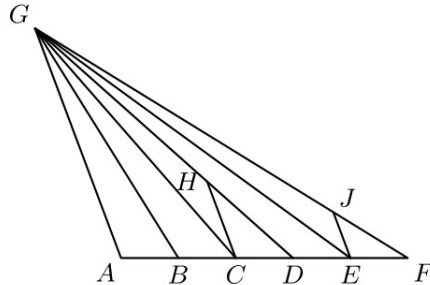

4   Problems

1. (2012 AMC 10A) Externally tangent circles with centers at points A and B have radii of lengths 5 and 3, respectively. A line externally tangent to both circles intersects ray AB at point C. What is BC?

2. (AMC 10A 2009) Rectangle ABCD has AB = 4 and BC = 3. Segment EF is constructed through B so that EF â DB, and A and C lie on DE and DF, respectively. What is EF?

3. (AHSME 1986) In △ ABC, AB = 8, BC = 7, CA = 6 and side BC is extended, as shown in the figure, to a point P so that △ PAB is similar to △PCA. What is the length of PC?
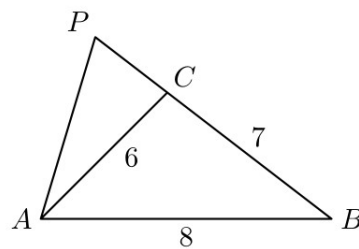
4. (BMmT 2019) June is making a pumpkin pie, which takes the shape of a truncated cone, as shown below. The pie tin is 18 inches wide at the top, 16 inches wide at the bottom, and 1 inch high. How many cubic inches of pumpkin filling are needed to fill the pie?
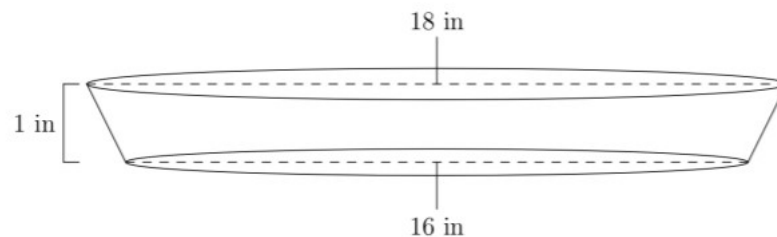
5. (AHSME 1990) Let ABCD be a parallelogram with $\angle$ ABC $= 120$ °, AB $= 16$ and BC $= 10$. Extend CD through D to E so that DE $= 4$. If BE intersects AD at F, then FD is closest to what integer?
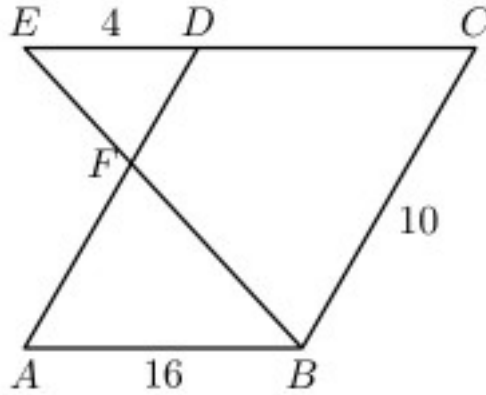
6. On square ABCD, points E and F are constructed on CD and AB respectively such that DE $=$ EC and AF $= 2$FB. Segment DF intersects AE and AC at P and Q respectively. If AB $=$ 3, what is PQ?