Math 206 - Test 3

Name Key

Chapter 11

Show all work to receive full credit. Partial credit may be given.

1. (4pts) Label the following as either possible or not possible. 1pt each

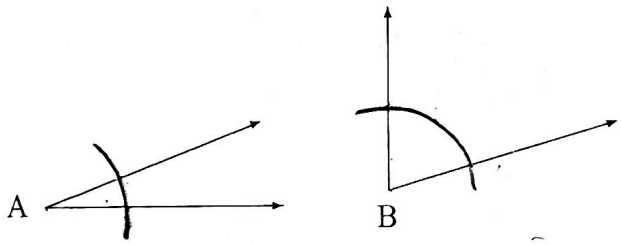
(a) not poss. A triangle with sides 4 cm, 5 cm, and 10 cm. $4+5<10$

(b) not poss. A triangle with sides 3 cm, 3 cm, and 7 cm. $3+3<7$

(c) possible A triangle with sides 8 cm, 6 cm, and 7 cm. $6+7>8$

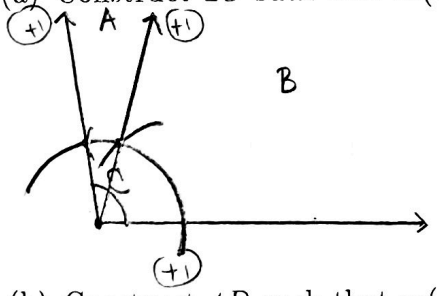
(d) not poss. A triangle with sides $\sqrt{2}$ cm, 3π cm, and 4.21 cm. $\sqrt{2}+4.21<3\pi$

2. (6pts) Consider the angles given below. Using only a compass and a straightedge, perform each of the following.



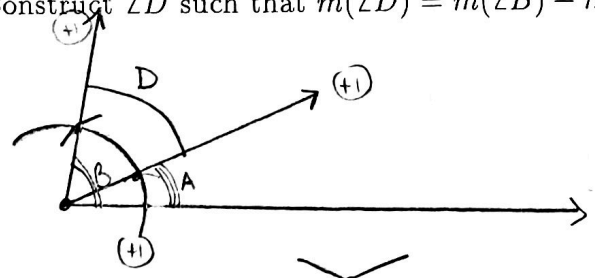
(a) Construct $\angle C$ such that $m(\angle C) = m(\angle A) + m(\angle B)$. Clearly label $\angle C$.

3pts

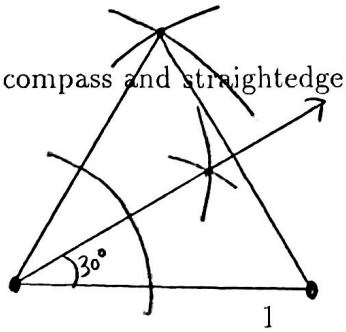


(b) Construct $\angle D$ such that $m(\angle D) = m(\angle B) - m(\angle A)$. Clearly label $\angle D$.

3pts



3. (5pts) Using only a compass and straightedge, construct a 30° angle.



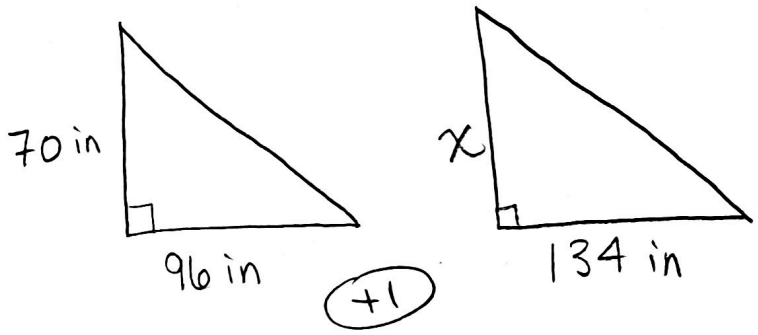
2pts equilateral triangle
3pts angle bisector

15

4. (3pts) Is a square with side length 20 in and a rectangle with length 60 in and width 40 in similar? Explain your yes or no answer.

(+1) No Their corresponding sides are not (+1) proportional. $\frac{20}{60} \neq \frac{20}{40}$ (+1)

5. (4pts) One sunny morning, Jeff, who is 5 ft 10 in tall, casts a shadow 8 ft long. At the same time, a nearby tree casts a shadow 11 ft 2 in long. How tall is the tree? Round your answer to 1 decimal place. (Hint: 1 ft=12 in)



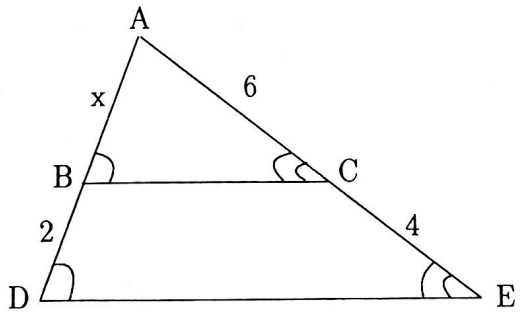
(+1)

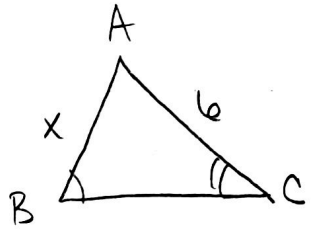
$\frac{70}{x} = \frac{96}{134}$ (+1)

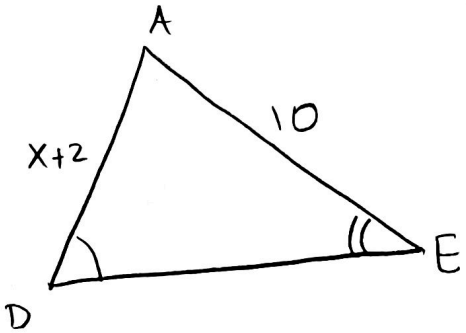
$96x = 9380$ (+1)

$x = 97.7$ in (+1)

6. (4pts) Given $\triangle ABC \sim \triangle ADE$ find x.







(+1)

$\frac{x}{x+2} = \frac{6}{10}$ (+1)

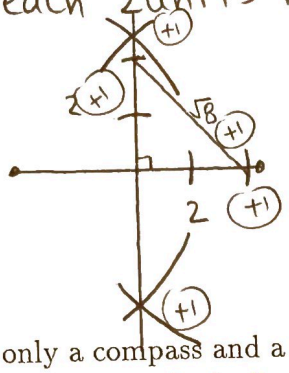
$10x = 6x + 12$ (+1)

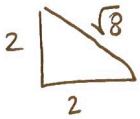
$4x = 12$

$x = 3$ (+1)

11

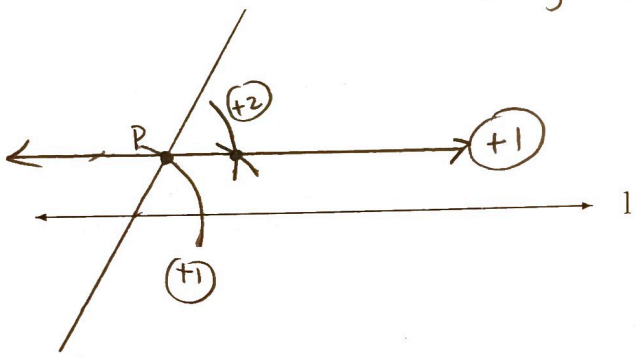
7. (6pts) Using only a compass and straightedge, construct a line segment that is exactly $\sqrt{8}$ units long. We need to construct a right triangle with sides that are each 2 units long.



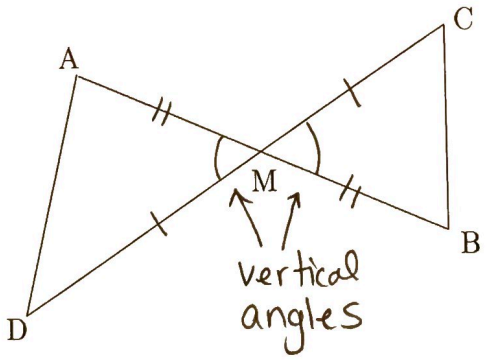


+1 $2^2+2^2=(\sqrt{8})^2$

8. (4pts) Using only a compass and a straightedge, construct a line parallel to line l. You may use any of the 3 methods discussed in class. using the rhombus method



9. (4pts) Given that $\overline{AB}$ and $\overline{CD}$ intersect at their common midpoint M. Show $\triangle ADM \cong \triangle BCM$.



+1 SAS

$\overline{AM} \cong \overline{MB}$ +1

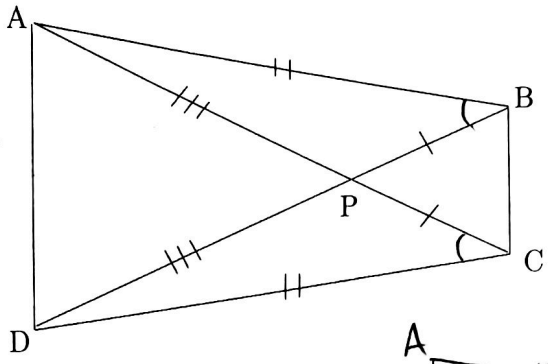
vert. angles +1

$\overline{DM} \cong \overline{MC}$ +1

14

10. (5pts) Find **two pair** of congruent triangles in this figure. Explain why each pair of triangles are congruent.

Answers may vary.



all sides given

$\Delta ABP \cong \Delta DPC$ SSS

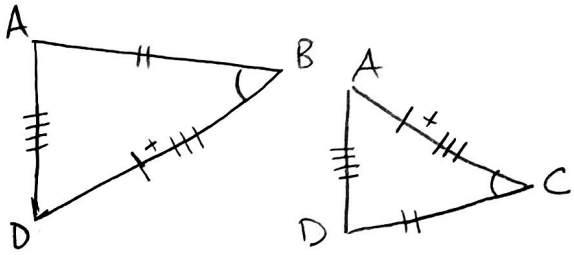
2pts

$\Delta ABD \cong \Delta ADC$ SAS

3pts

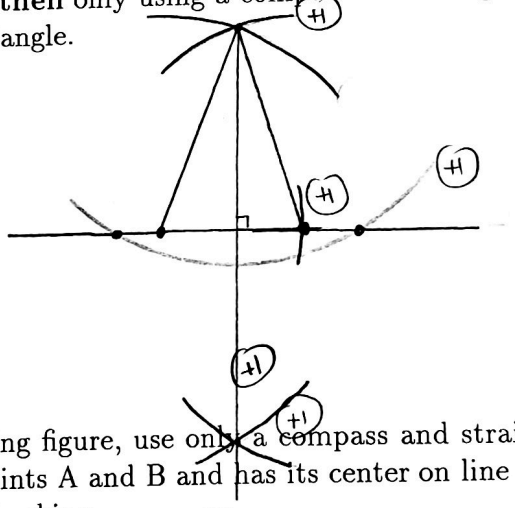
$\overline{AB} \cong \overline{DC}$ $\angle C \cong \angle B$ since $\Delta ABP \cong \Delta DPC$ $\overline{AC} \cong \overline{DB}$

OR SSS ← $\overline{AD}$ shared side

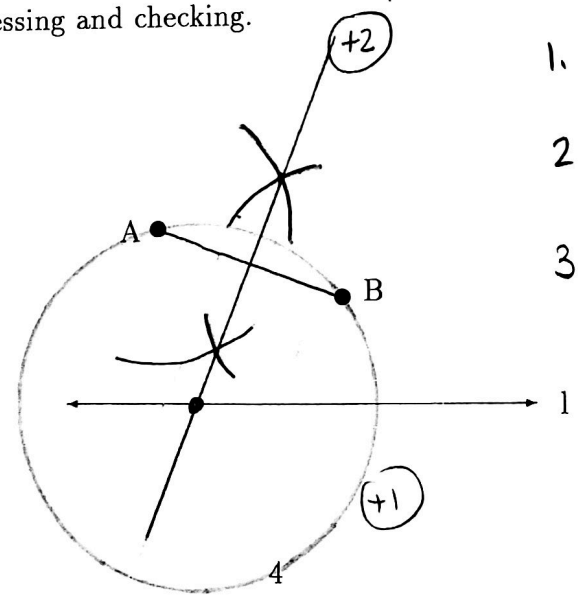


11. (5pts) Given the following two line segments, using only a compass and a straightedge, construct an isosceles triangle **then** only using a compass and straightedge, construct the altitude (height) of this triangle.

2pts triangle
3pts altitude



12. **3pts bonus** Given the following figure, use only a compass and straightedge to construct a circle that contains points A and B and has its center on line l. No credit will be awarded for guessing and checking.



1. Make a line segment connecting A to B
2. Construct the perp. bisector of $\overline{AB}$
3. Where the bisector crosses line l is the center of your circle.

10