

Name: ANSWERS

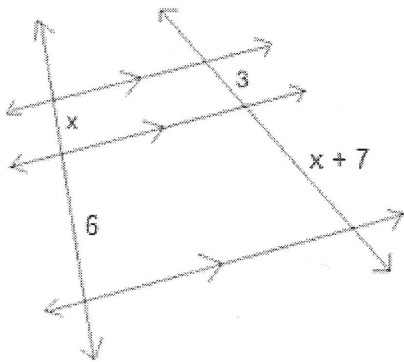
Monica

Geometry Period: _____

Date: _____

Directions: Answer all of the questions below. Be sure to show your work!

1) The three lines in the diagram below are parallel. Determine the value of x .



$$\frac{x}{6} = \frac{3}{x+7}$$

$$x(x+7) = 18$$

$$x^2 + 7x = 18$$

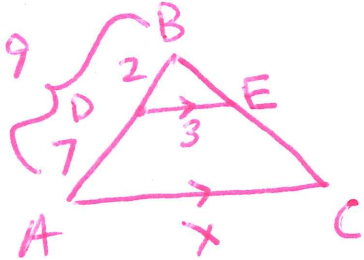
$$x^2 + 7x - 18 = 0$$

$$(x+9)(x-2) = 0$$

$$x = \cancel{9} \quad x = 2$$

$$x = 2$$

2) In $\triangle ABC$, point D is on \overline{AB} , and point E is on \overline{BC} such that $\overline{DE} \parallel \overline{AC}$. If $DB = 2$, $DA = 7$, and $DE = 3$, what is the length of \overline{AC} ?



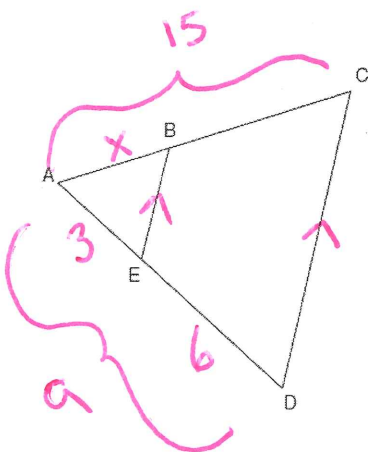
$$\frac{2}{3} = \frac{9}{x}$$

$$2x = 27$$

$$x = 13.5$$

$$AC = 13.5$$

3) In the diagram below of $\triangle ACD$, E is a point on \overline{AD} and B is a point on \overline{AC} , such that $\overline{EB} \parallel \overline{DC}$. If $AE = 3$, $ED = 6$, and $AC = 15$, find the length of \overline{AB} .



$$\frac{3}{9} = \frac{x}{15}$$

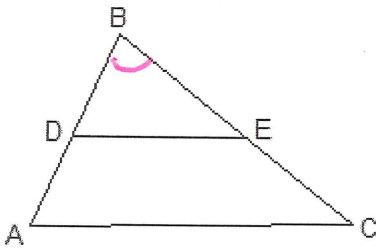
$$9x = 45$$

$$x = 5$$

$$AB = 5$$

4) In the diagram below, $\frac{AB}{DB} = \frac{CB}{EB}$. What additional piece of information is necessary to prove $\triangle ABC \sim \triangle DBE$?

With this additional piece of information, what theorem or postulate would you use to prove the triangles are similar?



$$\angle B \cong \angle B \quad \text{- reflexive}$$

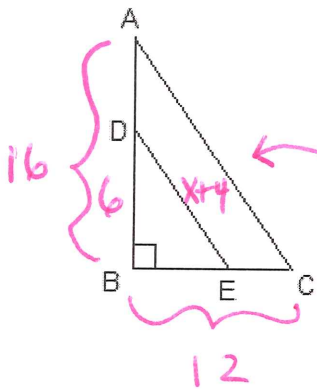
$$\triangle ABC \sim \triangle DBE \text{ b/c of SAS} \sim$$

5) Look back at question 4. Answer the question again using a **different** piece of information.

$$\frac{DE}{AC} = \frac{DB}{AB}$$

$$\triangle ABC \sim \triangle DBE \text{ b/c of SSS} \sim$$

6) In the diagram below, $\triangle ABC \sim \triangle DBE$. If $DB = 6$, $DE = x + 4$, $BC = 12$, and $AB = 16$, what is the value of x ?



$$AC^2 = 12^2 + 16^2$$

$$AC^2 = 400$$

$$AC = 20$$

$$\frac{6}{x+4} = \frac{16}{20}$$

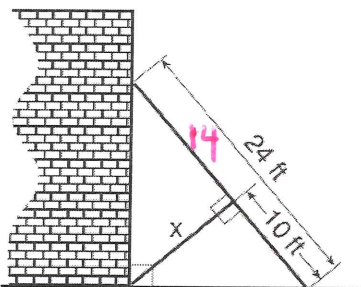
$$16(x+4) = 120$$

$$16x + 64 = 120$$

$$16x = 56$$

$$x = 3.5$$

7) The accompanying diagram shows a 24-foot ladder leaning against a building. A steel brace extends from the ladder to the point where the building meets the ground. The brace forms a right angle with the ladder. If the steel brace is connected to the ladder at a point that is 10 feet from the foot of the ladder, what is the value of x ? Write your answer in simplest radical form.



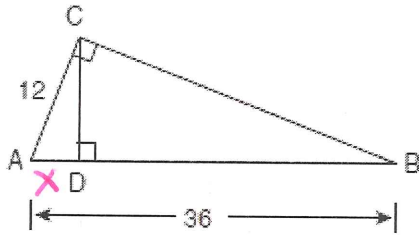
$$\frac{14}{x} = \frac{x}{10}$$

$$x^2 = 140$$

$$x = \sqrt{140}$$

$$x = 2\sqrt{35}$$

8) In the diagram below of right triangle ACB , altitude \overline{CD} is drawn to hypotenuse \overline{AB} . If $AB = 36$ and $AC = 12$, what is the length of \overline{AD} ?



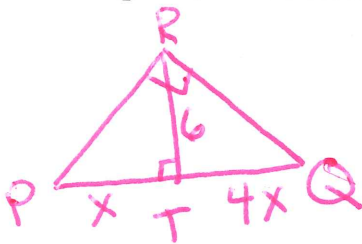
$$\frac{x}{12} = \frac{12}{36}$$

$$36x = 144$$

$$x = 4$$

$$\boxed{AD = 4}$$

9) In $\triangle PQR$, $\angle PRQ$ is a right angle and \overline{RT} is drawn perpendicular to hypotenuse \overline{PQ} . If $PT = x$, $RT = 6$, and $TQ = 4x$, what is the length of \overline{PQ} ?



$$\frac{x}{6} = \frac{6}{4x}$$

$$4x^2 = 36$$

$$x^2 = 9$$

$$x = 3$$

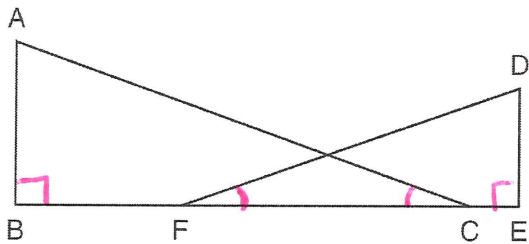
$$PQ = x + 4x$$

$$PQ = 5x$$

$$PQ = 5(3)$$

$$\boxed{PQ = 15}$$

10) In the diagram below, \overline{BFCE} , $\overline{AB} \perp \overline{BE}$, $\overline{DE} \perp \overline{BE}$, and $\angle DFC \cong \angle ACB$. Prove that $\triangle ABC \sim \triangle DEF$.

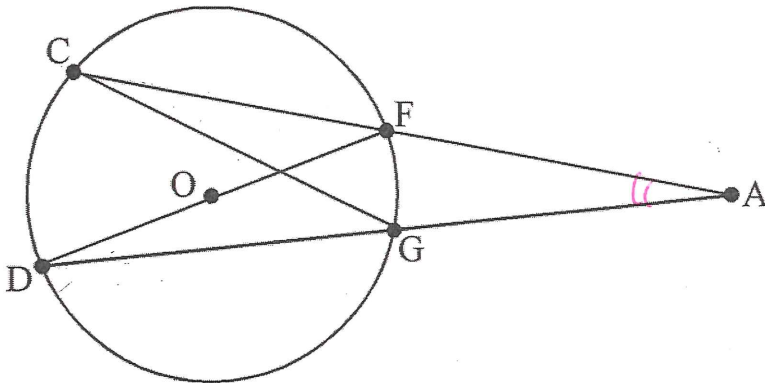


Statements	Reasons
1. $\overline{AB} \perp \overline{BE}$, $\overline{DE} \perp \overline{BE}$	1. Given
2. $\angle B = 90$, $\angle E = 90$	2. Def. of \perp
3. $\angle B \cong \angle E$	3. All right Δ s are \cong
4. $\angle DFC \cong \angle ACB$	4. Given
5. $\triangle ABC \sim \triangle DEF$	5. AA \sim

Please answer question 20 worth 6 points. Clearly show the necessary work it took for you to come to your answer. A correct numerical answer with no work shown will receive only 1 point. [6 points]

ii)

Look at the figure of circle O.



Show that $(\overline{AF})(\overline{AC}) = (\overline{AG})(\overline{AD})$ by proving triangle $ACG \sim$ triangle ADF .

Statements

Reasons

① $\angle FCG = \frac{1}{2} \widehat{FG}$

② $\angle FDG = \frac{1}{2} \widehat{FG}$

③ $\angle FCG \cong \angle FDG$

④ $\angle A \cong \angle A$

⑤ $\triangle ACG \sim \triangle ADF$

⑥ $\frac{AF}{AD} = \frac{AG}{AC}$

⑦ $(AF)(AC) = (AG)(AD)$

① inscribed \angle s are half of the intercepted arc

② inscribed \angle s are half of the intercepted arc

③ Substitution

④ Reflexive Property

⑤ AA \sim

⑥ corresponding parts of similar triangles are proportional

⑦ cross multiply