Honors Math 2
12.3 ws

Name _____ Key _____
Period _____ Date _____

Complete each statement.

1. In a parallelogram, opposite sides are _congruent_ and _parallel_ .

2. In a parallelogram, consecutive angles are _supplementary_.

3. In a parallelogram, diagonals _bisect_ each other, which means they split each other in

2 equal parts.

Complete each statement, using Parallelogram DCBA

4. If AD = 20, then BC = _20_

5. If AB = 13, then DC = _13_

6. If DB = 22, then DE = _11_

7. If AE = 18, then AC = _36_

8. If m∠ADC = 115°, then m∠ABC = _115°_

9. If m∠DAB = 75°, m∠ADC = _105°_

10. If m∠1 = 30°, then m∠4 = _30°_

11. If m∠AED= 72°, m∠DEC = _108_

12. If m∠ADC= 130°, and m∠1= 35°, m∠2= _15°_

13. If AC = 30 and AE = 3x + 3, then x = _4_
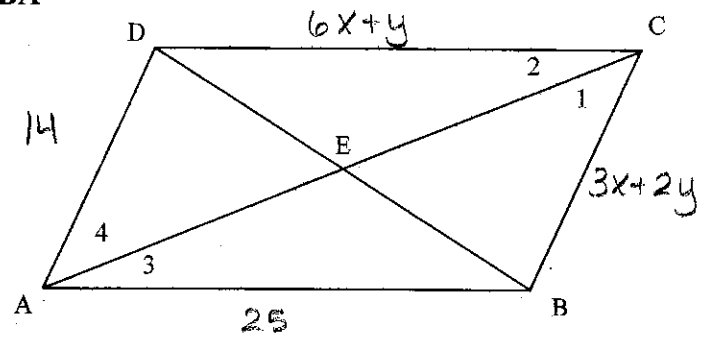
$2(3x+3) = 30$

$6x+6 = 30$

$6x = 24$

14. If DC = 6x + y, BC = 3x + 2y, AB = 25, and AD = 14, then x = _4_ and y = _1_

$3x+2y = 14$

$-2(6x + y = 25)$

$3x+2y=14$

$-12x-2y=-50$

$\overline{}$

$-9x = -36$

$x = 4$

$3(4)+2y = 14$

$2y = 2$

$y = 1$

Find the value of x.

15.

50°
(15x − 5)°
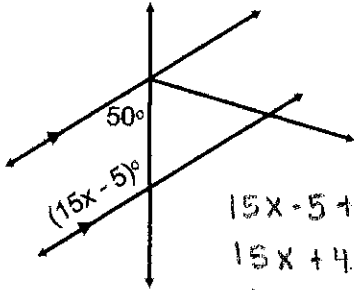
$15x - 5 + 50 = 180$
$15x + 45 = 180$
$15x = 135$
$x = 9$

16.

75°
(5x − 10)°
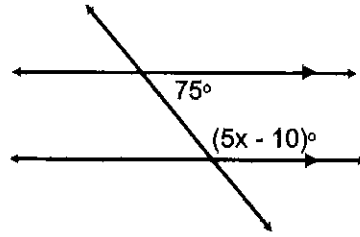
$5x - 10 + 75 = 180$
$5x + 65 = 180$
$5x = 115$
$x = 23$

17.

105° 105° (x − 2)°
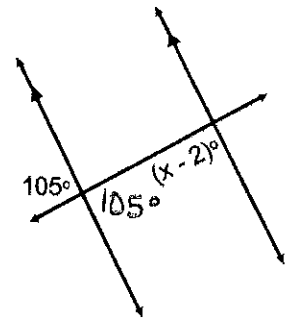
$x - 2 = 75$
$x = 77$

18. The perimeter of parallelogram ABCD is 184 cm. AB is 14 cm more than twice BC. What is the length of the longer sides?

A 2x+14 B
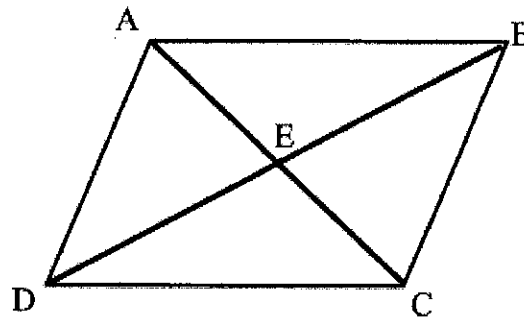x   x
D 2x+14 C
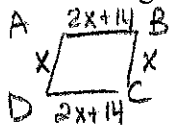
$6x + 28 = 184$
$6x = 156$
$x = 26$

26 & 66

| longer side 66 cm |

Given: ▱ ABCD, Find x

19. $AB = x^2 + 11$
     $CD = -6x + 2$

$x^2 + 11 = -6x + 2$
$x^2 + 6x + 9 = 0$
$(x + 3)(x + 3) = 0$
$x = -3$

20. $\angle ABC = 80°$
     $\angle ADC = (x + 10)°$

$x + 10 = 80$
$x = 70°$

21. $DE = 2x + 1$
     $EB = x^2 - 5x + 7$

$2x + 1 = x^2 - 5x + 7$
$x^2 - 7x + 6 = 0$
$(x - 6)(x - 1) = 0$
$x = 6, 1$

22. $\angle DAB = 120°$
     $\angle BCD = (2x + 16)°$

$2x + 16 = 120$
$2x = 104$
$x = 52°$

23. $\angle ABC = (5x - 12)°$
     $\angle BCD = (8x - 32)°$

$5x - 12 + 8x - 32 = 180$
$13x - 44 = 180$
$13x = 224$
$x = 17.2°$

24. $AE = 6x - 15$
     $AC = 4x + 50$

$2(6x - 15) = 4x + 50$
$12x - 30 = 4x + 50$
$8x = 80$
$x = 10$

25. Find the area of parallelogram ABCD.

$Area = (Base)(Height)$

$A = (8)(6)$

$A = 48 \text{ cm}^2$

A ―――― 8 cm ―――― B

10 cm

6 cm

7 cm

D   C
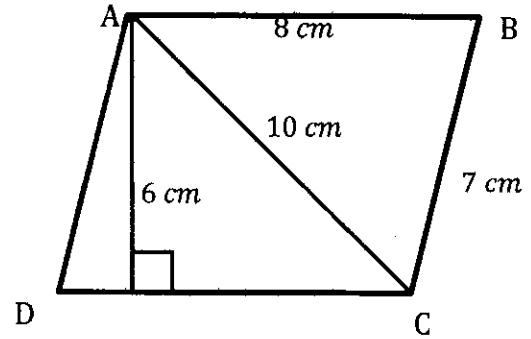
AB is a midsegment, find the value of x.

26.

$2(2x+3) = x+21$

$4x+6 = x+21$

$3x = 15$

$x = 5$

A $2x+3$ B

$x+21$

27.

A

$3x-10$

$2x+8$

B
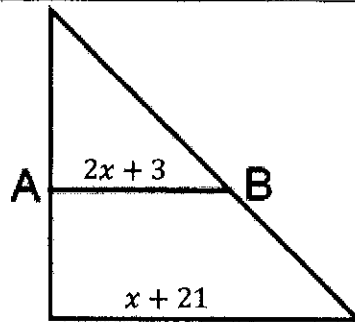
$2(3x-10) = 2x+8$

$6x-20 = 2x+8$

$4x = 28$

$x = 7$

28.

x^2-14

$3x+1$

A

B
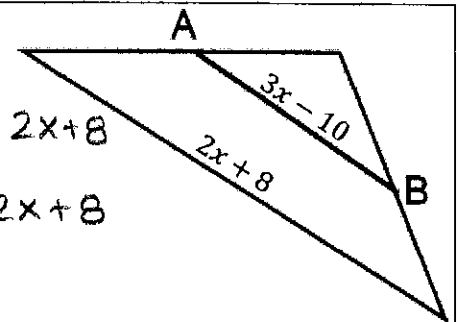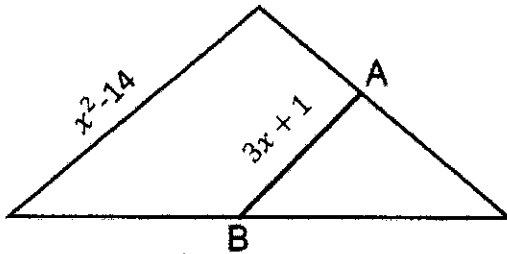
$x^2-14 = 2(3x+1)$

$x^2-14 = 6x+2$

$x^2-6x-16 = 0$

$(x-8)(x+2) = 0$

$x = 8, \cancel{-2}$

29.

$6x$

x^2-10

A   B
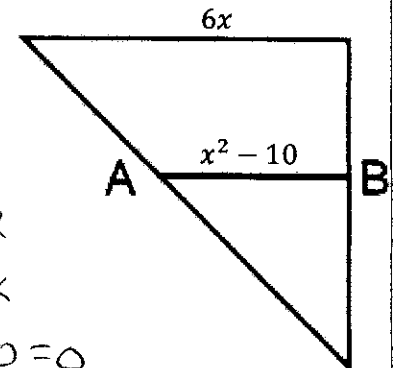
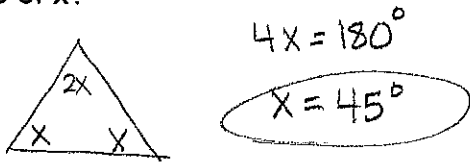$2(x^2-10) = 6x$

$2x^2-20 = 6x$

$2x^2-6x-20 = 0$
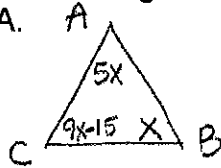
$2(x^2-3x-10) = 0$

$2(x-5)(x+2) = 0$

$x = 5, \cancel{-2}$

30. If the base angles of an isosceles triangle measure x and the vertex angle measures 2x, what is the value of x?

$$4x = 180°$$

$$x = 45°$$

31. In Triangle ABC, the measure of angle A is 5 times the measure of angle B, and the measure of angle C is 15 degrees less than nine times the measure of angle B. Find the measure of angle A.
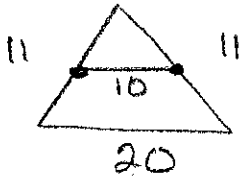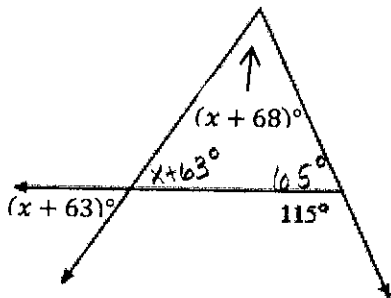
$$15x - 15 = 180$$

$$15x = 195$$

$$x = 13$$

$$\angle A = 65°$$

32. If the midsegment of an isosceles triangle is 10 meters and each of the congruent sides of the triangle are 11 meters, what is the measure of the side parallel to the midsegment?
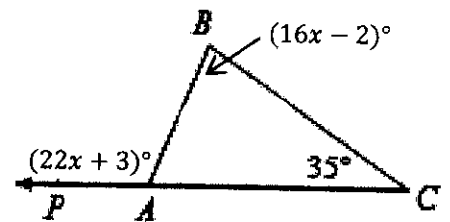
11   11
10
20

Solve for x.

33.

$(x + 68)°$
$x + 63°$
$(x + 63)°$
$65°$
$115°$

$$x + 68 + x + 63° + 65 = 180$$

$$2x + 196 = 180$$

$$2x = -16$$

$$x = -8$$

34.

B
$(16x - 2)°$
$(22x + 3)°$
$35°$
P A C

$$22x + 3 = 16x - 2 + 35$$

$$6x = 30$$

$$x = 5$$