

Key

Math 1

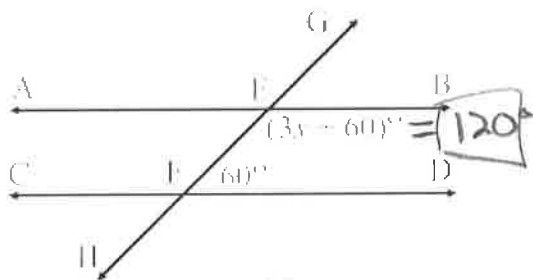
Name _____

Date _____

6-2 Parallel Lines with Algebra 1

In the following problems, $\overline{AB} \parallel \overline{CD}$. Solve for the variable and determine the measure of the unknown angle(s).

1.



Same-side Interior

$$3x + 60 + 60 = 180$$

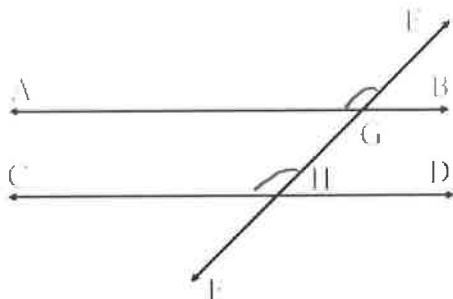
$$3x + 120 = 180$$

$$3x = 60$$

$$x = 20$$

$$m\angle FEB = 120^\circ$$

2. $m\angle EGA = 2x + 30$, $m\angle EHC = x + 80$



Corresponding Angles

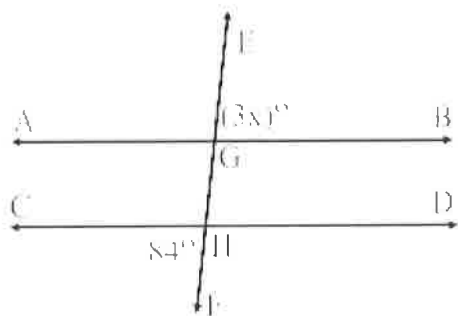
$$2x + 30 = x + 80$$

$$x = 50$$

$$m\angle EGA = 2(50) + 30 = 130^\circ$$

$$m\angle EHC = 130^\circ$$

3.



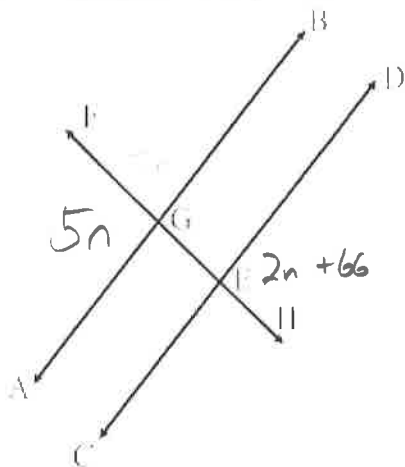
Alternate Exterior Angles

$$3x = 84$$

$$x = 28$$

$$m\angle EGB = 84^\circ$$

4. $m\angle AGF = 5n$, $m\angle HED = 2n + 66$



Alternate Exterior

$$5n = 2n + 66$$

$$3n = 66$$

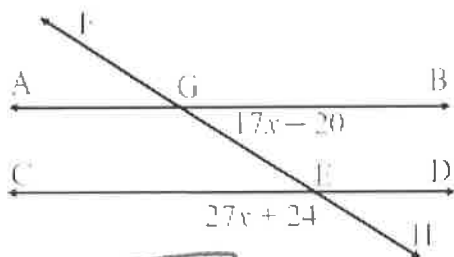
$$n = 22$$

$$m\angle AGF = 5(22) = 110^\circ$$

$$m\angle HED = 2(22) + 66 = 110^\circ$$

$$\angle CEG = 17x - 20 \text{ (Alt. Interior with } \angle BGD)$$

5.



$\angle CEG$ Linear Pair with $\angle CEH$

$$17x - 20 + 27x + 24 = 180$$

$$44x + 4 = 180$$

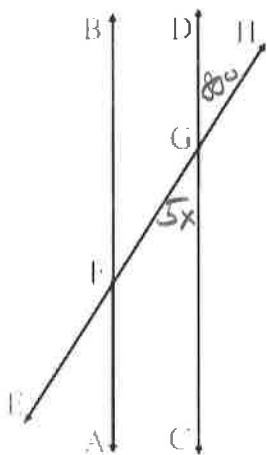
$$44x = 176$$

$$x = 4$$

$$m\angle CEH = \boxed{132^\circ}$$

$$m\angle BGE = 17(4) - 20 = \boxed{48^\circ}$$

6. $m\angle DGH = 80^\circ$, $m\angle EGC = 5x$



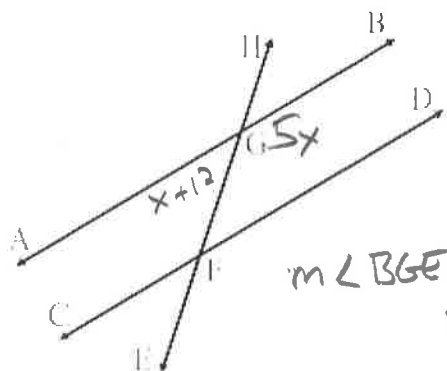
Vertical Angles

$$5x = 80$$

$$x = 16$$

$$m\angle EGC = 5(16) = \boxed{80^\circ}$$

7. $m\angle BGE = 5x$, $m\angle AGE = x + 12$



$$m\angle BGE = 5 \cdot 28 = \boxed{140^\circ}$$

$$m\angle AGE = \boxed{40^\circ}$$

Linear Pair

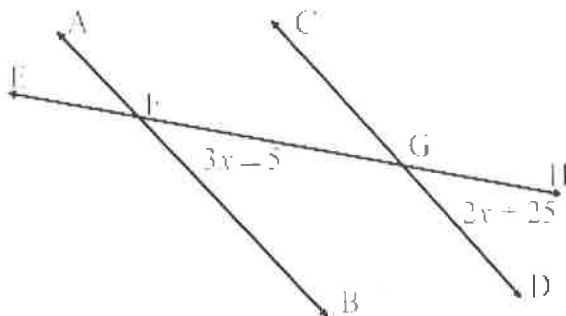
$$5x + x + 12 = 180$$

$$6x + 12 = 180$$

$$6x = 168$$

$$x = 28$$

8.



Corresponding Angles

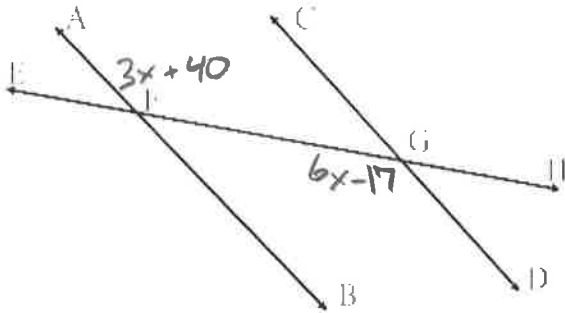
$$2x + 25 = 3x - 5$$

$$\boxed{30 = x}$$

$$m\angle HGD = 2(30) + 25 = \boxed{85^\circ}$$

$$m\angle BFG = \boxed{85^\circ}$$

9. $m\angle AFG = 3x + 40$, $m\angle FGD = 6x - 17$



Alternate Interior Angles

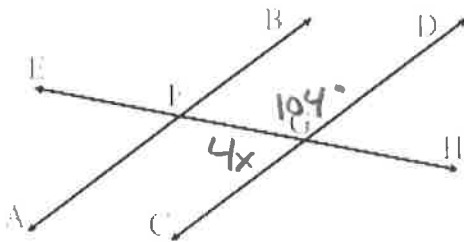
$$3x + 40 = 6x - 17$$

$$57 = 3x$$

$$19 = x$$

$$m\angle AFG = m\angle FGD = 6(19) - 17 = 97^\circ$$

10. $m\angle EGD = 104$, $m\angle EGC = 4x$



Linear Pair

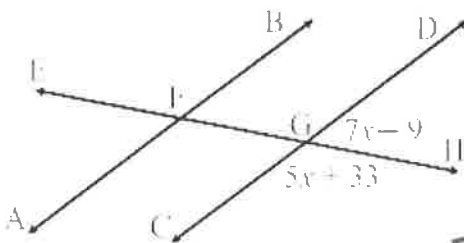
$$4x + 104 = 180$$

$$4x = 76$$

$$x = 19$$

$$m\angle EGC = 76^\circ$$

11.



Linear Pair

$$7x - 9 + 5x + 33 = 180$$

$$12x + 24 = 180$$

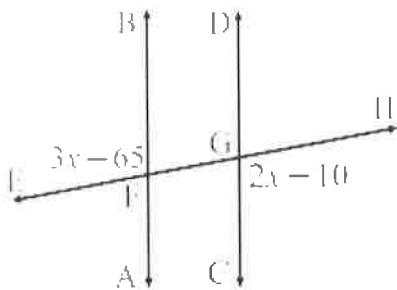
$$12x = 156$$

$$x = 13$$

$$m\angle DGH = 7(13) - 9 = 82^\circ$$

$$m\angle CGH = 180 - 82 = 98^\circ$$

12.



Alternate Exterior Angles

$$3x - 65 = 2x - 10$$

$$x = 55$$

$$m\angle EFB = m\angle CGH = 2(55) - 10 = 100^\circ$$