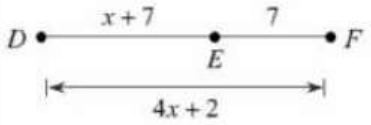
Find *DF*



$x+7+7 = 4x+2$

$x+14 = 4x+2$

$14 = 3x+2$

$12 = 3x$

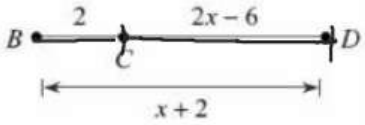
$x = 4$

$DF = 4(4)+2$

$= 16+2$

$= 18$

6) Find *CD*



$2+2x-6 = x+2$

$2x-4 = x+2$

$x-4 = 2$

$x = 6$

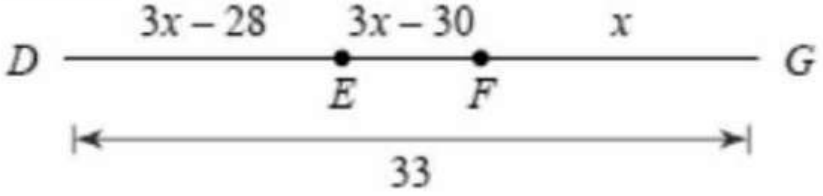
$CD = 2x-6$

$2(6)-6$

$12-6$

6

Find DE



$DE + EF + FG = DG$

$3x - 28 + 3x - 30 + x = 33$

$7x - 58 = 33$

$7x = 91$

$x = 13$

$DE = 3x - 28$

$= 3(13) - 28$

$= 39 - 28$

$= 11$

Write the following as a conditional statement

An isosceles triangle has at least 2 congruent sides. If → then

If a triangle is isosceles, then it has at least 2 $\cong$ sides.

Write the converse of your conditional statement. Switch If-then

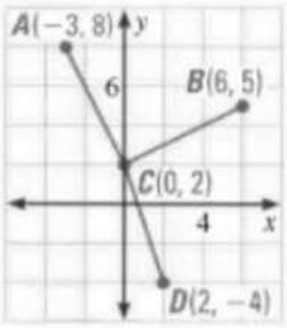
If a triangle has at least 2 $\cong$ sides, then the triangle is isosceles.

Combine your two statements above into one bicondtional statement. Replace If-then with if and only if

A triangle is isosceles if and only if at least 2 sides are $\cong$.

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

DISTANCE FORMULA **Find the lengths of the segments. Tell whether any of the segments have the same length.**



$AC = BC$

$\overline{AC} \cong \overline{BC}$

$(-3,8)\ (0,2)$

$AC = \sqrt{(0-(-3))^2 + (2-8)^2}$

$= \sqrt{(3)^2 + (-6)^2} = \sqrt{9+36} = \sqrt{45}$

$(6,5)\ (0,2)$

$BC = \sqrt{(0-6)^2 + (2-5)^2}$

$= \sqrt{(-6)^2 + (-3)^2} = \sqrt{9+36} = \sqrt{45}$

$CD = \sqrt{(0-2)^2 + (2-(-4))^2}$

$= \sqrt{(-2)^2 + (6)^2}$

$\sqrt{4+36} = \sqrt{40}$

Find the midpoint with the given endpoints .

$$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

(-2, 3) and (8, 5)

$$\left(\frac{-2+8}{2}, \frac{3+5}{2}\right)$$

$$\left(\frac{6}{2}, \frac{8}{2}\right)$$

$$(3, 4)$$

(4, 6) and (-5, -2

$$\left(\frac{4+(-5)}{2}, \frac{6+(-2)}{2}\right)$$

$$\left(\frac{-1}{2}, \frac{4}{2}\right)$$

$$\left(-\frac{1}{2}, 2\right)$$

You are given one endpoint of a segment R, and the midpoint M.
Find the other endpoint .

R (2, 6)

M (-1, 1)

(x_2, y_2)

$2\left(\frac{2+x_2}{2}\right)=(-1)^2$ $2\left(\frac{6+y_2}{2}\right)=(1)^2$

$2+x_2=-2$ $6+y_2=2$

$-2 \quad -2$ $-6 \quad -6$

$x_2=-4$ $y_2=-4$

$(-4,-4)$

R (3, -12

M (2, -1

$2\left(\frac{3+x_2}{2}\right)=(2)^2$ $2\left(\frac{-12+y_2}{2}\right)=(-1)^2$

$3+x_2=4$ $-12+y_2=-2$

$x_2=1$ $y_2=10$

$(1,10)$

Write the inverse and contrapositive of the given conditional statement

If it is January, then it has 31 days

Inverse — opposite "not"

Inverse

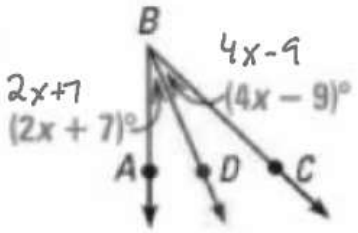
If it is not January, then it does not have 31 days

Contrapositive → Converse of Inverse

↳ switch If → then

If it does not have 31 days, then it is not January

USING ALGEBRA $\overrightarrow{BD}$ **bisects** $\angle ABC$. **Find the value of** x.



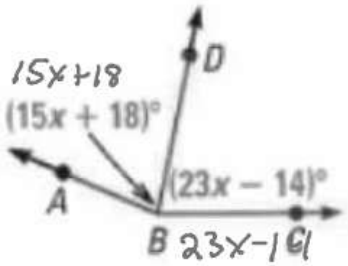
$2x+7 = 4x-9$

$7 = 2x-9$

$16 = 2x$

$x = 8$

48.



$15x+18 = 23x-14$

$18 = 8x-14$

$32 = 8x$

$x = 4$

FINDING ANGLES **In Exercises 12–17, complete the statement given that $m\angle EHC = m\angle DHB = m\angle AHB = 90°$**

12. If $m\angle 7 = 28°$, then $m\angle 3 =$? 28

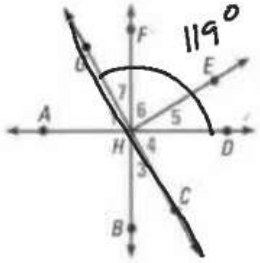
13. If $m\angle EHB = 121°$, then $m\angle 7 =$?

14. If $m\angle 3 = 34°$, then $m\angle 5 =$?

15. If $m\angle GHB = 158°$, then $m\angle FHC =$?

16. If $m\angle 7 = 31°$, then $m\angle 6 =$?

17. If $m\angle GHD = 119°$, then $m\angle 4 =$?



119°

180-119

m∠4

121-90

31

m∠3+m∠4=90°

34 + m∠4 = 90°

= 56

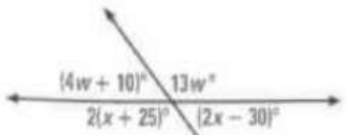
Write the 2 conditional statements implied by the biconditional statement

A quadrilateral is a paralellogram if and only if the opposite angles are congruent

If a quadrilateral is a parallelogram, then the opposite angles are $\cong$

If a quadrilateral has opposite angle $\cong$, then it is a parallelogram

Find the value of the variable(s)



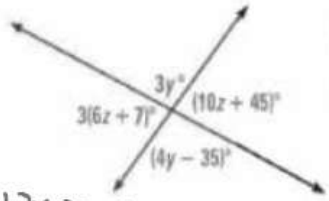
$4w+10+13w=180$

$17w+10=180$

$17w=170$

$w=10$

28.



$2(x+25)+2x-30=180$

$2x+50+2x-30=180$

$4x+20=180$

$4x=160$

$x=40$

$3y=4y-35$

$-y=-35$

$y=35$

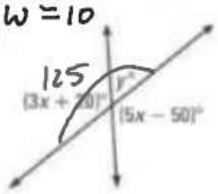
$3(6z+7)=10z+45$

$18z+21=10z+45$

$8z+21=45$

$8z=24$

$z=3$



$3x+20=5x-50$

$20=2x-50$

$70=2x$

$x=35$

$3(35)+20$

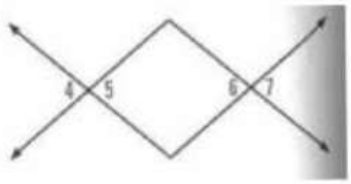
125

$y+125=180$

$y=55$

GIVEN ▶ $\angle 5 \cong \angle 6$

PROVE ▶ $\angle 4 \cong \angle 7$



Statement	Reason
1) $\angle 5 \cong \angle 6$	1) Given
2) $\angle 4 \cong \angle 5$ $\angle 6 \cong \angle 7$	2) Vertical $\angle$'s are $\cong$
3) $\angle 4 \cong \angle 7$	3) Substitution prop

Write the converse of the given conditional statement

If the month is Feburary, then it is the shortest month of the yea

Use the conditional statement and the converse you wrote to write a biconditional statemen

GIVEN ▶ $\angle 1$ and $\angle 2$ are complements, $\angle 3$ and $\angle 4$ are complements, $\angle 2 \cong \angle 4$

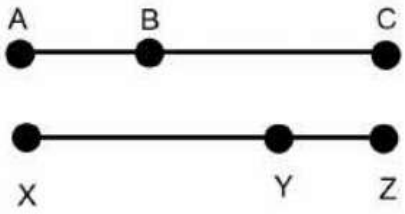
PROVE ▶ $\angle 1 \cong \angle 3$

Statements	Reasons
1. $\angle 1$ and $\angle 2$ are complements, $\angle 3$ and $\angle 4$ are complements, $\angle 2 \cong \angle 4$	**1.** ?
2. ?, ?	**2.** Def. of complementary angles
3. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	**3.** Transitive property of equality
4. $m\angle 2 = m\angle 4$	**4.** ?
5. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	**5.** ?
6. $m\angle 1 = m\angle 3$	**6.** ?
7. ?	**7.** Definition of congruent angles

Given: $\overline{BC} \cong \overline{YX}$

$\overline{AC} \cong \overline{ZX}$

Prove: $\overline{AB} \cong \overline{ZY}$



Statement	Reason
1)	1)
2) BC = YZ, AC = ZX	2)
3) AC = AB + BC XZ = XY + YZ	3)
4) AB + BC = XY + YZ	4)
5) AB + BC = XY + BC	5)
6)	6) Subtraction Property
7)	7)