24. In this drawing, line p is parallel to line j and line t is perpendicular to $\overline{AB}$. What is the measure of $\angle BAC$?

$55 + 90 + m\angle BAC = 180$

$m\angle BAC + 145 = 180$

$\boxed{m\angle BAC = 35°}$
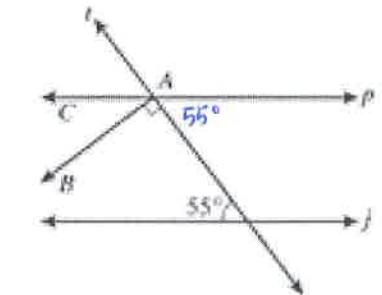
25. Alejandra is playing pool. The path of the ball is shown in the diagram below.
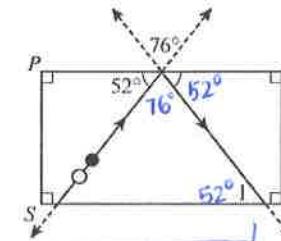
What is the measure of $\angle 1$?

(F) 52°
(G) 76°
(H) 104°
(J) 128°

26. Do the equations of the following lines make them parallel, perpendicular, or neither?

a. $l:\ y = \dfrac{1}{3}x - 2 \quad h:\ 6y = 2x + 12$

$m = \dfrac{1}{3}$

$y = \dfrac{2}{6}x + \dfrac{12}{6}$

$y = \dfrac{1}{3}x + 2$

$m = \dfrac{1}{3}$

$\boxed{\text{Parallel}}$

b. $q:\ 4x - 2y = 6 \quad w:\ 2x + 4y = 6$

$-2y = -4x + 6$

$y = \dfrac{-4x}{-2} + \dfrac{6}{-2}$

$y = 2x - 3$

$m = 2$

$4y = -2x + 6$

$y = \dfrac{-2x}{4} + \dfrac{6}{4}$

$y = -\dfrac{1}{2}x + \dfrac{3}{2}$

$m = -\dfrac{1}{2}$ $\boxed{\text{Perpendicular}}$

27. Write an equation of a line which passes through P(-2, 5) and is perpendicular to the line $y = 3x - 7$.

new slope: $-\dfrac{1}{3}$ thru (-2, 5)

$b = \dfrac{15}{3} - \dfrac{2}{3}$

$b = \dfrac{13}{3}$

$y = mx + b$

$5 = -\dfrac{1}{3}(-2) + b$

$5 = \dfrac{2}{3} + b$

$\dfrac{5}{1} = \dfrac{2}{3} + b$

$b = \dfrac{5}{1} - \dfrac{2}{3}$

$\boxed{y = -\dfrac{1}{3}x + \dfrac{13}{3}}$

4

28. Given $l \parallel m$, find the values of x. Be sure to check for extraneous solutions. Diagram is not drawn to scale.
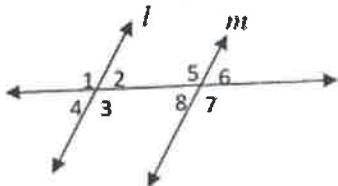
a) $m\angle 3 = (x^2 + 112)°$, $m\angle 8 = (16x + 131)°$ ← consec. interior

$x^2 + 112 + 16x + 131 = 180$

$x^2 + 16x + 243 = 180$

$x^2 + 16x + 63 = 0$

$(x+9)(x+7) = 0$

~~$x = -9$~~, $\boxed{x = -7}$

check: $x = -9$:
~~$(-9)^2 + 112 = 193°$~~
~~$16(-9) + 131 = -13°$~~

$x = -7$:
$(-7)^2 + 112 = 161°$
$16(-7) + 131 = 19°$

b) $m\angle 1 = (x^2 - 7x)°$, $m\angle 7 = (-x + 7)°$ ← alt exterior

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

$x^2 - 6x - 7 = 0$

$(x-7)(x+1) = 0$

~~$x = 7$~~, $\boxed{x = -1}$

check: $x = 7$:
~~$(7)^2 - 7(7) = 0°$~~
~~$-7 + 7 = 0°$~~

$x = -1$:
$(-1)^2 - 7(-1) = 8°$
$-(-1) + 7 = 8°$

29. Given $p \parallel t$, $m\angle 1 = (12x - 4y)°$, $m\angle 8 = (x - 4y)°$, and $m\angle 5 = (15x + 8y)°$, find the values of x and y, and the measure of each angle.

$12x - 4y = 15x + 8y$

→ $-3x - 12y = 0$

$-36 - 12y = 0$

$-12y = 36$ $\boxed{y = -3}$

$15x + 8y + x - 4y = 180$

→ $16x + 4y = 180$

$-3x - 12y = 0$ →

$3(16x + 4y = 180)$

$-3x - 12y = 0$

$48x + 12y = 540$

_____

$45x = 540$

$\boxed{x = 12}$

$\boxed{\begin{array}{l} m\angle 1 = 156° \\ m\angle 8 = 24° \\ m\angle 5 = 156° \end{array}}$
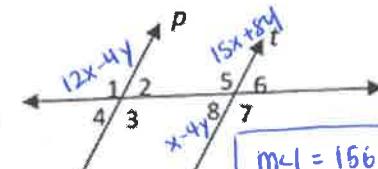
30. Find the value of x so that $n \parallel m$. State the theorem or postulate that justifies your solution.
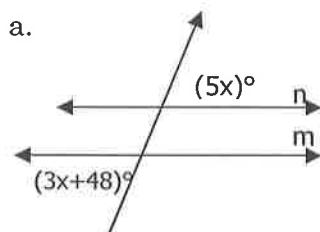
a.

$(5x)°$ n
   m
$(3x+48)°$

$5x = 3x + 48$

$2x = 48$ Alt Ext Ang

$\boxed{x = 24}$ converse

b.

$(5x+23)°$ $(7x+13)°$

$5x + 23 = 7x + 13$

$23 = 2x + 13$ Corresponding

$10 = 2x$ Angles

$\boxed{x = 5}$ converse

c.

$(5x-18)°$

$(8x-5)°$ m
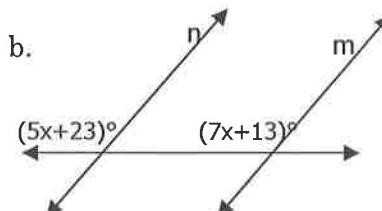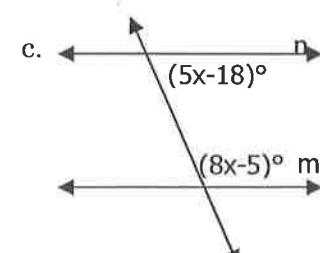
$5x - 18 + 8x - 5 = 180$

$13x - 23 = 180$

$13x = 203$ Consec. Int

$\boxed{x = 203/13}$ Angles Converse

31. What values of x and y would make lines a and b parallel?

$(2x - 15)°$ a

$(4y + 25)°$ $(x + 30)°$ ₁₅
   b
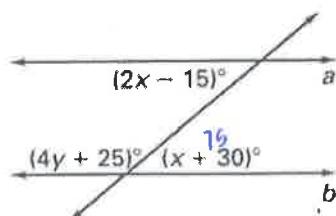
$2x - 15 = x + 30$

$x - 15 = 30$

$\boxed{x = 45}$

$4y + 25 + 75 = 180$

$4y + 100 = 180$

$4y = 80$

$\boxed{y = 20}$

5

32. Given: $m\angle LNF = (3x-15)^\circ$, $m\angle EFN = (2x+10)^\circ$, $\overleftrightarrow{LN} \parallel \overleftrightarrow{EF}$. Please prove: $x = 37$

| Statements	Reasons
1. $m\angle LNF = (3x-15)^\circ$ $m\angle EFN = (2x+10)^\circ$ $\overleftrightarrow{LN} \parallel \overleftrightarrow{EF}$	1. Given
2. $3x-15+2x+10 = 180$	2. Consec. Interior Ang. Thm
3. $5x-5 = 180$	3. Combine Like Terms
4. $5x = 185$	4. Addition Prop.
5. $x = 37$	5. Division Prop
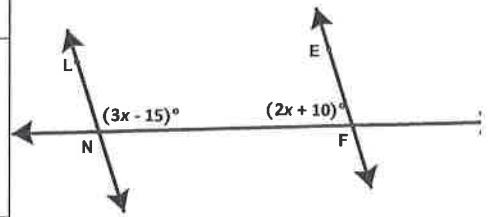
33. Given: $\angle 1 \cong \angle 2$, $\angle 1 \cong \angle 4$. Please prove $x \parallel y$.

Statements	Reasons
1. $\angle 1 \cong \angle 2$	1. Given
2. $a \parallel b$	2. Alt. Int. Angles Converse
3. $\angle 3 \cong \angle 4$	3. Corresponding Ang. Theorem
4. $\angle 1 \cong \angle 4$	4. Given
5. $\angle 2 \cong \angle 4$	5. Transitive Prop
6. $x \parallel y$	6. Corresponding Ang. Converse
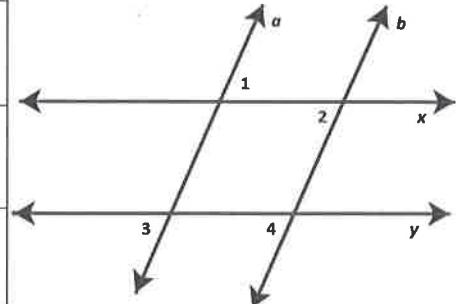
34. Please solve for x, y, and z.
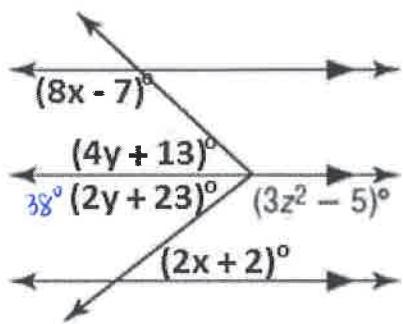
$8x-7+4y+13=180$ $2y+23=2x+2$

$\rightarrow 8x+4y=174$ $\rightarrow -2x+2y=-21$

$(8x - 7)°$
$(4y + 13)°$
$38°\ (2y + 23)°\quad (3z^2 - 5)°$
$(2x + 2)°$

$8x+4y=174$
$4(-2x+2y=-21)\ \Rightarrow$
$\begin{array}{l} 8x+4y=174 \\ -8x+8y=-84 \\ \hline 12y=90 \end{array}$

$\boxed{y=7.5}$

$8x+4(7.5)=174$

$8x=144$

$\boxed{x=18}$

$38+3z^2-5=180$

$3z^2+33=180$

$3z^2=147$

$z^2=49$

$\boxed{z=7\ \text{or}\ z=-7}$