Directions: Solve each equation. Show all your steps and write a justification for each step.

1) $\frac{1}{5}(a + 10) = -3$

Statements	Reasons
1) $\frac{1}{5}(a+10)=-3$	1) Given
2) $\frac{1}{5}a + 2 = -3$	2) Distributive Prop.
3) $\frac{1}{5}a = -5$	3) Subt. prop. =
4 $a = -25$	4) mult. prop. =

2) t + 6.5 = 3t − 1.3

Statements	Reasons
1) $t + 6.5 = 3t - 1.3$	1) Given
2) $6.5 = 2t - 1.3$	2) Subt. prop =
3) $7.8 = 2t$	3) Add prop =
4) $3.9 = t$	4) Div Prop =
5) $t = 3.9$	5) symm. prop =

3) The formula for the perimeter P of a rectangle with length, l, and width, w, is P = 2(l + w). The perimeter of a rectangle is 9.5 feet and the width is 1.25 ft. Solve the equation for l and justify each step.

Statements	Reasons
1) $P=2(L+w)$; $P=9.5, W=1.25$	1) Given
2) $9.5=2(L+1.25)$	2) subst. prop =
3) $9.5 = 2L + 2.5$	3) Dist. Prop.
4) $7 = 2L$	4) Subt. Prop =
5) $3.5 = L$	5) Div. Prop =

Directions: Identify the property that justifies each statement.

4) m = n, so n = m

symmetric prop.

5) $\angle ABC \cong \angle ABC$

reflexive prop.

6) $\overline{KL} \cong \overline{LK}$

reflexive prop.

7) p = q & q = 3, so p = 3

transitive prop.

Directions: Write a justification for each step.

8) Given: M − N = 10; M = 2x − 5; N = −x + 6

M − N = 10	Given
(2x − 5) − (−x + 6) = 10	Substitution
2x − 5 + x − 6 = 10	Dist. Prop.
3x − 11 = 10	Combine like terms
3x = 21	Add Prop. =
x = 7	Div. Prop =

Directions: Complete each proof.

9) Given: $3x - 2y = 12$

Prove: $y = \frac{3}{2}x - 6$

Statements	Reasons
1) $3x-2y=12$	1) Given
2) $-2y=-3x+12$	2) Subtr. prop =
3) $y=\frac{3}{2}x-6$	3) div. prop =

10) Given: $7 = \frac{2x-1}{3}$

Prove: $x = 11$

Statements	Reasons
1) $7=\frac{2x-1}{3}$	1) Given
2) $21=2x-1$	2) Mult. Prop =
3) $22=2x$	3) Add Prop =
4) $11=x$	4) Div. Prop =
5) $x=11$	5) Sym. Prop =

11) Given: $5(x - 4) - 3x = -36$

Prove: $x = -8$

Statements	Reasons
1) $5(x-4)-3x=-36$	1) Given
2) $5x-20-3x=-36$	2) Dist. Prop.
3) $2x-20=-36$	3) Combine like terms
4) $2x=-16$	4) Add Prop =
5) $x=-8$	5) Div. Prop =

12) Given: $2L + 2w + 2h = A$

Prove: $w = \frac{A}{2} - L - h$

Statements	Reasons
1) $2L+2w+2h=A$	1) Given
2) $2w=A-2L-2h$	2) subt. prop. =
3) $w=\frac{A}{2}-L-h$	3) Div prop =

13) Given: $\angle A$ and $\angle B$ are vertical angles,

$m\angle A = (12x - 38)^\circ$, & $m\angle B = (8x + 6)^\circ$

Prove: $m\angle A = 94^\circ$

Statements	Reasons
1) $\angle A$ & $\angle B$ vert. $\angle$s $m\angle A=(12x-38)^\circ$; $m\angle B=(8x+6)^\circ$	1) Given
2) $\angle A \cong \angle B$	2) Vert. $\angle$'s are $\cong$
3) $m\angle A = m\angle B$	3) Def. $\cong$ $\angle$'s
4) $12x-38=8x+6$	4) Subst. prop. =
5) $4x-38=6$	5) Subt. prop =
6) $4x=44$	6) Add Prop =
7) $x=11$	7) Div Prop =
8) $m\angle A=(12\cdot 11-38)^\circ$	8) Subst. prop =
9) $m\angle A=94^\circ$	9) Simplify

14) Given: $\angle C$ and $\angle D$ are complementary $\angle$'s,

$m\angle C = (4x - 10)^\circ$, & $m\angle D = (2x + 34)^\circ$

Prove: $m\angle D = 56^\circ$

Statements	Reasons
1) $\angle C$ & $\angle D$ are comp $\angle$'s; $m\angle C=(4x-10)^\circ$; $m\angle D=(2x+34)^\circ$	1) Given
2) $m\angle C+m\angle D=90^\circ$	2) def. comp. $\angle$'s
3) $4x-10+2x+34=90$	3) Subst. prop.
4) $6x+24=90$	4) combine like terms
5) $6x=66$	5) Subt. prop. =
6) $x=11$	6) div. prop =
7) $m\angle D=2\cdot 11+34$	7) subst. prop =
8) $m\angle D=56^\circ$	8) Simplify