1) $7n+52$
linear; n^1

2) $\frac{1}{n^3}-19n$; non linear
$\frac{1}{n^3}=n^{-3} \neq n^1$

3) $(15n)^4$: nonlinear

4) $\frac{n+5}{2}$; linear : n^1

5) $8(n-3)$; linear : n^1

6) $n^2-(2n+4)$: nonlinear
n^2

7) $\frac{1}{3}(3n+12)$: linear
n^1

8) $5(n+\frac{1}{2})$: linear

9) $8v+77=5(5-v)$
$8v+77=25-5v$
$8v+5v+77=25$
$13v+77=25$
$13v=25-77$
$13v=-52$
$v=\frac{-52}{13}$
$v=-4$
$13(-4)+77=25$
$-52+77=25$ ✓
$25=25$

10) $59+x=2-2x$
$59+3x=2$
$3x=2-59$
$3x=-57$
$x=-\frac{57}{3}=-19$
$59+-19=2-2(-19)$
$40=2-2(-19)$
$40=2+38$
$40=40$ ✓

11) $5(2+n)=3(n+6)$
$10+5n=3n+18$
$10+2n=18$
$2n=8$
$n=4$
$10+5(4)=3(4)+18$
$30=12+18$ ✓

12) $5x+5(1-x)=x+8$
$5x+5-5x=x+8$
$5=x+8$
$-3=x$

13) $6-2(-3-x)=-9x+1$
$6+6+2x=-9x+1$
$12+2x=-9x+1$
$12+11x=1$
$11x=-11$
$x=-1$
$12+2(-1)=-9(-1)+1$
$12-2=9+1$
$10=10$ ✓

14) $-4(3+x)=2-(5+x)$
$-12+-4x=2-5-x$
$-12-4x=-3-x$
$-12=-3+3x$
$-9=3x$
$-3=x$

15) $6-5(x+4)=-2x-11$

$6-5x-20=-2x-11$

$-14=3x-11$

$-3=3x$

$-1=x$

16) $-11x+7=6(4-x)$

$-11x+7=24-6x$

$7=24+5x$

$7-24=5x$

$-17=5x$

$-\frac{17}{5}=x$

$7-24+5\left(\frac{17}{5}\right)$

$-17=5\left(\frac{-17}{5}\right)$

$-17=-17$ ✓

17) $\frac{7m+1}{b}=\frac{7(3)+1}{2}$

$=\frac{21+1}{2}=\frac{22}{2}=11$

18. $\frac{2(n+x)}{n-x}=\frac{2(10+6)}{10-6}$

$=\frac{2(16)}{4}=\frac{32}{4}=8$

19) $x[b(m+1)-3]$

$6[2(3+1)-3]$

$6[2(4)-3]$

$6[8-3]$

$6[5]$

30

20) $\frac{mn-5y}{a+b}=\frac{3\cdot 10-0}{3}$

$=\frac{30}{3}=10$

21) $\sqrt{25}=5$

22 $\sqrt{5^2+12^2}=\sqrt{25+144}=\sqrt{169}=13$

23) $\sqrt{8^2+15^2}=\sqrt{64+225}=\sqrt{289}=17$

24) $\sqrt{49+576}=\sqrt{625}=25$

25) $x+5x-13=140$

$6x-13=140$

$6x=153$

$x=\frac{153}{6}$ 25.5

26) $3n+17+7n+3=180°$

$10n+20=180°$

$10n=160$

$n=16.0°$

27) $\angle A=2\angle B$ $\angle C=\frac{1}{2}B-2$

$A+B+C=180°$

$2B+B+\frac{1}{2}B-2=180°$

$3B+\frac{1}{2}B-2=180°$

$\frac{7}{2}B-2=180°$

$\frac{7}{2}B=182°$

$B=182\left(\frac{2}{7}\right)=(26)(2)=52°$

$A=2(52)=104°$

$C=\frac{1}{2}(52)-2=26-2=24°$

$52+104+24=180°$ ✓

28. $7n - 5 = 7n + 8$

$7n - 7n - 5 = 7n - 7n + 8$

$0 - 5 = 0 + 8$

$-5 \neq 8$

they are not corresponding because they do not equal; no value of $\underline{n}$ makes the equation true

29)

$x - (9x - 10) + 11 = 12x + 3\left(-2x + \frac{1}{3}\right)$

$x - 9x + 10 + 11 = 12x + -6x + 1$

$-8x + 21 = 6x + 1$

$21 = 14x + 1$

$20 = 14x$

$\frac{20}{14} = x$

$= \frac{10}{7} = x$

30)

$7x + 8\left(x + \frac{1}{4}\right) = 3(6x - 9) - 8$

$7x + 8x + 2 = 18x - 27 - 8$

$15x + 2 = 18x - 35$

$2 = 3x - 35$

$37 = 3x$

$\frac{37}{3} = x$

31) $-4x - 2(8x + 1) = -(-2x - 10)$

$-4x - 16x - 2 = 2x + 10$

$-20x - 2 = 2x + 10$

$-2 = 22x + 10$

$-12 = 22x$

$\frac{-12}{22} = x$

$= -\frac{6}{11} = x$

32)

$37x + \frac{1}{2} - \left(x + \frac{1}{4}\right) = 9(4x - 7) + 5$

$37x + \frac{1}{2} - x - \frac{1}{4} = 36x - 63 + 5$

$36x + \frac{1}{4} = 36x - 58$

$36x - 36x + \frac{1}{4} = 36x - 36x - 58$

$\frac{1}{4} \neq -58$

no real solution