More Difference of Perfect Squares – Answers

1. (a) $(a^{50}-2)(a^{50}+2)$ (b) $(5^n-7)(5^n+7)$ (c) $(x^{15}-3)(x^{15}+3)$
(d) $(10c-2^n)(10c+2^n)$ (e) $8(x-2)(x+2)$ (f) $(5a-7y)(5a+7y)$
(g) $3(t-3)(t+3)$ (h) $x^2(x-5)(x+5)$ (i) $(c-b)(c+b)$
(j) $3(7z-5)(7z+5)$ (k) $(t-k)(t+k)(t^2+k^2)$ (l) $(1-k^n)(1+k^n)$
(m) $(x^n-3)(x^n+3)$ (n) $(k-a^n)(k+a^n)$ (o) $(t^3-w^2h)(t^3+w^2h)$
(p) $(x^n-y^n)(x^n+y^n)(x^{2n}+y^{2n})$

2. (a) $(x-y)(x+y+1)$ (b) $(x+y)(x-y-1)$ (c) $(2a-b)(2a+b-1)$
(d) $(a+2b)(a-2b+1)$

3. (a) $4a(x^n-3)(x^n+3)$ (b) $(r-2)(r+2)(r^2+4)$

4. (a) $[(4n+1)-(n+4)][(4n+1)+(n+4)]$
$=(4n+1-n-4)(4n+1+n+4)$
$=(3n-3)(5n+5)$
$=3(n-1)(5)(n+1)$
$=15(n-1)(n+1)$ and for $n\in Z$ this is an integer multiple of 15 and so is divisible by 15
(b) similarly done.

5. Hint: set up $(x+1)^2-x^2=\ldots$

6. $(2n+3)^2-(2n+1)^2=\ldots$

7. (a) $(x^2-3)(x^2+2)(x^4-x^2+6)$ (b) $x(x-1)(x+1)$
(c) $(b-1)(a-1)(a+1)$ (d) $(b-1)(x-2)(x+2)$

8. (a) $68\cdot72$
Consider $a+b=72$ ①
$a-b=68$ ②
① + ②: $2a=140$
$a=70$
$b=2$
$\Rightarrow 68\cdot72=(70-2)(70+2)$
$=4900-4$
$=4896$ ✓

9. (a) $\dfrac{53^2-27^2}{79^2-51^2}=\dfrac{(53-27)(53+27)}{(79-51)(79+51)}=\dfrac{(26)(80)}{(28)(130)}=\ldots$ reduce the fractions!