Power of a Function/Chain Rule for Derivatives

Find the derivatives for each of the following functions and express in factored form:

1. $(2x-1)^2(3x+4)^2$
2. $(x^2+1)^2(x^3+8)$
3. $(x^2+x)^2(2x+5)^2$
4. $(3x+2)^3(5-x^2)$
5. $(2+x)^{-1}(x^2+4)$
6. $(x-1)^{-2}(x+4)$
7. $(2x-1)^{-1}(x+2)^{-2}$
8. $x\sqrt{1-x^2}$
9. $(x+3)\sqrt{x^2+2x}$
10. $(3x+1)\sqrt{x^2-5}$
11. $(3-5t)\sqrt{1-3t^2}$
12. $(5t-3)\sqrt{3t^2-2t}$
13. $(3-t)\sqrt{5t^2+3t+1}$
14. $(x^2+3x)\sqrt{3x+5}$
15. $\sqrt{1-3x}\sqrt{3x^2-5}$
16. $\sqrt{1+x^3}\sqrt{1-x^2}$
17. $\sqrt{x^2-3x}\sqrt{x^3-5}$
18. $\sqrt[3]{3x+x^3}\sqrt{x^2-2}$

Answers

1. $2(2x-1)(3x+4)(12x+5)$
2. $x(x^2+1)(7x^3+3x+32)$
3. $2x(x+1)(2x+5)(6x^2+14x+5)$
4. $(3x+2)^2(45-4x-15x^2)$
5. $(x^2+4x-4)(x+2)^{-2}$
6. $-(x-1)^{-3}(x+9)$
7. $-2(3x+1)(2x-1)^{-2}(x+2)^{-3}$
8. $(1-x^2)^{-\frac{1}{2}}(1-2x^2)$
9. $(x^2+2x)^{-\frac{1}{2}}(2x^2+6x+3)$
10. $(x^2-5)^{-\frac{1}{2}}(6x^2+x-15)$
11. $(1-3t^2)^{-\frac{1}{2}}(30t^2-9t-5)$
12. $3(3t^2-2t)^{-\frac{1}{2}}(10t^2-8t+1)$
13. $-\frac{1}{2}(5t^2+3t+1)^{-\frac{1}{2}}(20t^2-21t-7)$
14. $\frac{1}{2}(3x+5)^{-\frac{1}{2}}(15x^2+47x+30)$
15. $-\frac{3}{2}(1-3x)^{-\frac{1}{2}}(3x^2-5)^{-\frac{1}{2}}(9x^2-2x-5)$
16. $-\frac{1}{2}x(1-x^2)^{-\frac{1}{2}}(1+x^3)^{-\frac{1}{2}}(5x^3-3x+2)$
17. $\frac{1}{2}(x^3-5)^{-\frac{1}{2}}(x^2-3x)^{-\frac{1}{2}}(5x^4-12x^3-10x+15)$
18. $(x^2-2)^{-\frac{1}{2}}(3x+x^3)^{-\frac{2}{3}}(2x^4+2x^2-2)$