

Algebra II
Unit 2 Test 1 Review

Name LEY

Add or subtract.

1. $(5x^2 - 6x + 10) - (9x^2 - 4x + 3)$

$$\begin{array}{r} 5x^2 - 6x + 10 \\ - 9x^2 + 4x - 3 \\ \hline \end{array}$$

$$\boxed{-4x^2 - 2x + 7}$$

2. $(7x^2 + 3x - 10) - (12x^2 + 6x + 3)$

$$\begin{array}{r} 7x^2 + 3x - 10 \\ - 12x^2 - 6x - 3 \\ \hline \end{array}$$

$$\boxed{-5x^2 - 3x - 13}$$

3. $(5x^2 - 15x - 13) + (9x^2 - 4x - 6)$

$$\begin{array}{r} 5x^2 - 15x - 13 \\ + 9x^2 - 4x - 6 \\ \hline \end{array}$$

$$\boxed{14x^2 - 19x - 19}$$

4. $(14x^2 - x + 12) + (3x^2 + x - 4)$

$$\begin{array}{r} 14x^2 - x + 12 \\ + 3x^2 + x - 4 \\ \hline \end{array}$$

$$\boxed{17x^2 + 8}$$

Multiply.

5. $(7x^3 - 6x - 4)(2x^2)$

$$\boxed{14x^5 - 12x^3 - 8x^2}$$

6. $(4x)(6x^2 - 5x - 3)$

$$\boxed{24x^3 - 20x^2 - 12x}$$

7. $(4x - 6)(5x + 7)$

$$20x^2 + 28x - 30x - 42$$

$$\boxed{20x^2 - 2x - 42}$$

8. $(x - 3)(2x - 5)$

$$2x^2 - 5x - 6x + 15$$

$$\boxed{2x^2 - 11x + 15}$$

9. $(5x^2 - 6)(4x^3 + 7x^2 + 2x)$

$$20x^5 + 35x^4 + 10x^3 - 24x^3 - 42x^2 - 12x$$

$$\boxed{20x^5 + 35x^4 - 14x^3 - 42x^2 - 12x}$$

Divide using synthetic division.

10. $(12x^3 - 11x^2 + 7x + 14) \div (x + 3)$

$$\begin{array}{r} -3 \overline{) 12 \ -11 \ 7 \ 14} \\ \underline{\downarrow -36 \ 141 \ -444} \\ 12 \ -47 \ 148 \ -430 \end{array}$$

$$\boxed{12x^2 - 47x + 148 - \frac{430}{x+3}}$$

11. $(6x^5 - 33x^4 + 150x^2 - 96) \div (x - 4)$

$$\begin{array}{r} 4 \overline{) 6 \ -33 \ 0 \ 150 \ 0 \ -96} \\ \underline{\downarrow 24 \ -36 \ -144 \ 24 \ 96} \\ 6 \ -9 \ -36 \ 6 \ 24 \ 0 \end{array}$$

$$\boxed{6x^4 - 9x^3 - 36x^2 + 6x + 24}$$

12. $(7x^3 - 4x^2 + 7x + 18) \div (x + 2)$

$$\begin{array}{r} -2 \overline{) 7 \ -4 \ 7 \ 18} \\ \underline{\downarrow -14 \ 36 \ -86} \\ 7 \ -18 \ 43 \ -68 \end{array}$$

$$\boxed{7x^2 - 18x + 43 - \frac{68}{x+2}}$$

13. $(2x^4 - 7x^3 - 15x - 4) \div (x - 4)$

$$\begin{array}{r} 4 \overline{) 2 \ -7 \ 0 \ -15 \ -4} \\ \underline{\downarrow 8 \ 4 \ 16 \ 4} \\ 2 \ 1 \ 4 \ 1 \ 0 \end{array}$$

$$\boxed{2x^3 + x^2 + 4x + 1}$$

For 14-6 use $f(x) = 2x + 3$ and $g(x) = x - 7$

14. Find $(f + g)(x)$

$$\begin{aligned} &= (2x+3) + (x-7) \\ &= 2x+3+x-7 \\ &= \boxed{3x-4} \end{aligned}$$

15. Find $(f - g)(x)$

$$\begin{aligned} &= (2x+3) - (x-7) \\ &= 2x+3-x+7 \\ &= \boxed{x+10} \end{aligned}$$

16. Find $(fg)(x)$

$$\begin{aligned} &= (2x+3)(x-7) \\ &= 2x^2-14x+3x-21 \\ &= \boxed{2x^2-11x-21} \end{aligned}$$

17. Find $\left(\frac{f}{g}\right)(x)$

$$= \boxed{\frac{2x+3}{x-7}}$$

18. Find $(f \circ g)(x) = f(g(x))$

$$\begin{aligned} &= 2(x-7)+3 \\ &= 2x-14+3 \\ &= \boxed{2x-11} \end{aligned}$$

19. Find $(g \circ f)(x) = g(f(x))$

$$\begin{aligned} &= (2x+3)-7 \\ &= 2x+3-7 \\ &= \boxed{2x-4} \end{aligned}$$

For 20-21 use $f(x) = x - 5$ and $g(x) = x^2 + 2$

20. Find $(f \circ g)(x) = f(g(x))$

$$\begin{aligned} &= (x^2+2)-5 \\ &= x^2+2-5 \\ &= \boxed{x^2-3} \end{aligned}$$

21. Find $(g \circ f)(x) = g(f(x))$

$$\begin{aligned} &= (x-5)^2+2 \\ &= (x-5)(x-5)+2 \\ &= x^2-5x-5x+25+2 = \boxed{x^2-10x+27} \end{aligned}$$

For 22-27 use $f(x) = x - 5$ and $g(x) = x^2 + 2$

22. Find $(f + g)(0)$

$$\begin{aligned} &= (0-5) + ((0)^2+2) \\ &= -5+2 \\ &= \boxed{-3} \end{aligned}$$

23. Find $(f - g)(4)$

$$\begin{aligned} &= (4-5) - ((4)^2+2) \\ &= -1 - (18) = -1-18 = \boxed{-19} \end{aligned}$$

24. Find $(fg)(1)$

$$\begin{aligned} &= (1-5)((1)^2+2) \\ &= (-4)(3) \\ &= \boxed{-12} \end{aligned}$$

25. Find $\left(\frac{f}{g}\right)(-2)$

$$= \frac{(-2)-5}{(-2)^2+2} = \boxed{\frac{-7}{6}}$$

26. Find $(f \circ g)(-3) = f(g(-3))$

$$\begin{aligned} \textcircled{1} & g(-3) = (-3)^2+2 = 9+2=11 \\ \textcircled{2} & f(11) = 11-5 = \boxed{6} \end{aligned}$$

27. Find $(g \circ f)(5) = g(f(5))$

$$\begin{aligned} \textcircled{1} & f(5) = 5-5=0 \\ \textcircled{2} & g(0) = (0)^2+2 = \boxed{2} \end{aligned}$$