

Final Exam Review

Algebra 2 ID: 1

Name _____ Date _____ Period _____

Assignment
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Simplify each sum.

- 1) $(k + 3k^4 - 8k^2) + (8k^3 + 8k - 5k^4 + 2)$
 A) $-2k^4 + 5k + 7$
 B) $-2k^4 + 9k + 7$
 C) $-2k^4 + 7$
 D) $2k^4 + 9k + 2$

Simplify each difference.

- 2) $(5x + 1 - 2x^2) - (-7x - 5x^2)$
 A) $3x^3 + 12x + 1$
 B) $5x^3 + 12x + 1$
 C) $x^2 + 15x + 6$
 D) $5x^3 + 12x + 6$



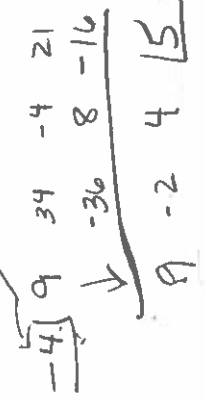
- Find each product.**
- 3) $(7b + 4)(2b^2 + b - 6)$
 A) $14b^3 + 15b^2 - 38b - 24$
 B) $42b^3 - 98b^2 + 112b - 56$
 C) $8b^3 - 45b^2 - 23b + 30$
 D) $24b^3 + 28b^2 - 52b + 10$

- 4) $(r - 8)^2 \rightarrow (r - 8)(r - 8)$
 A) $49r^2 + 112r + 64$
 B) $r^2 - 16r + 64$
 C) $r^2 - 64$
 D) $r^2 + 64$

Divide using SYNTHETIC DIVISION.

- 5) $(x^3 - 9x^2 + 15x + 3) \div (x - 7)$
 A) $x^2 - 2x + 2 + \frac{12}{x - 7}$
 B) $x^2 - 2x + 3 + \frac{9}{x - 7}$
 C) $x^2 - 2x + 1 + \frac{10}{x - 7}$
 D) $x^2 - 2x - 1 + \frac{9}{x - 7}$

- 6) $(9n^3 + 34n^2 - 4n + 21) \div (n + 4)$
 A) $9n^2 - 2n + 4 + \frac{5}{n + 4}$
 B) $9n^2 - 2n + 3 + \frac{5}{n + 4}$
 C) $9n^2 - 2n + 6 + \frac{1}{n + 4}$
 D) $9n^2 - 2n + 3 + \frac{1}{n + 4}$



Use SYNTHETIC DIVISION to help factor each. One factor has been given. (HINT: grouping)

- 7) $f(x) = x^4 - 5x^3 + 7x^2 - 5x + 6; x - 3$
 A) $f(x) = (x - 2)(x^2 + 1)(x + 4)$
 B) $f(x) = x^2(x - 2)(x + 2)$
 C) $f(x) = (x - 2)(x^2 + 1)(x - 3)$
 D) $f(x) = (x + 1)(x^2 + 1)(x - 3)$
- 8) $f(x) = x^4 + 5x^3 + 10x^2 + 20x + 24; x + 3$
 A) $f(x) = 3(x + 2)(x^2 + 5)(x + 1)$
 B) $f(x) = (x + 2)(x^2 + 4)(x + 3)$
 C) $f(x) = (x + 2)(3x^2 + 4)(x + 3)$
 D) $f(x) = x(x^2 + 4)(x + 3)$

Use SYNTHETIC DIVISION to find all zeros. One zero has been given. (HINT: grouping)

- 9) $f(x) = x^4 - 10x^2 + 9; -3$
 A) $\{0, 3, -1, -3\}$
 B) $\{3, -1, 1, -3\}$
 C) $\{0, 3, 1, -3\}$
 D) $\{3, -1 \text{ mult. } 2, -3\}$
- 10) $f(x) = x^4 + 2x^3 - 13x^2 + 10x; 2$
 A) $\{0, 1, -5, 2\}$
 B) $\{0, 1, -4, -2\}$
 C) $\{0, 1, -5, -2\}$
 D) $\{0, 1, -\frac{5}{2}, 2\}$

Write a polynomial function of least degree that has real coefficients, the following zeros, and a leading coefficient of 1.

- 11) $-1, -3, 3$ $(x+1)(x+3)(x-3)$
 A) $f(x) = x^3 + x^2 - 9x - 6$
 B) $f(x) = x^3 + x^2 - 12x - 9$
 C) $f(x) = x^3 + x^2 - 9x - 9$
 D) $f(x) = x^3 + x^2 - 9x - 10$
- 12) $-4, 4, 3i$ $(x+4)(x-4)(x-3i)$
 A) $f(x) = x^4 - 4x^3 - 7x^2 - 144$
 B) $f(x) = x^4 - 7x^2 - 144$
 C) $f(x) = x^4 - 7x^2 + 4x - 144$
 D) $f(x) = x^4 - x^2 - 144$
- 13) $(x+3)(x-5)$
 14) $(x+3)(x-5)$

Simplify each expression.

- 13) $\frac{3m-9}{3} \cdot \frac{20}{m^2-11m+24}$
 A) $m-2$ B) $\frac{m+8}{6m^2}$
 C) $\frac{20}{m-8}$ D) $\frac{m-8}{(m+5)(m-4)}$
- 14) $\frac{p^2-5p-24}{8p-64} \cdot \frac{p+3}{4p+12}$
 A) $\frac{p+3}{32}$ B) $49p$
 C) $\frac{7}{p+3}$ D) $\frac{p-8}{p+4}$

Factor

→ same, change, flip

- 15) $\frac{8x-72}{9x^3-72x^2} \div \frac{x-9}{9x^3-72x^2}$
 A) $\frac{x-4}{30x}$ B) $\frac{8}{8}$
 C) $x+4$ D) $\frac{2}{x-8}$

Evaluate each infinite geometric series described.

- 50) $\sum_{n=1}^{\infty} 5 \left(-\frac{1}{4}\right)^{n-1}$
 A) 4 B) $\frac{4}{3}$
 C) 2 D) No sum

Describe the end behavior of each function.

- 52) $f(x) = x^5 - 3x^3 + 3x - 2$
 A) $f(x) \rightarrow \infty$ as $x \rightarrow \infty$
 B) $f(x) \rightarrow \infty$ as $x \rightarrow -\infty$
 C) $f(x) \rightarrow -\infty$ as $x \rightarrow \infty$
 D) $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$
- 53) $f(x) = -x^2 - 2$
 A) $f(x) \rightarrow \infty$ as $x \rightarrow \infty$
 B) $f(x) \rightarrow \infty$ as $x \rightarrow -\infty$
 C) $f(x) \rightarrow \infty$ as $x \rightarrow \infty$
 D) $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$

These are listed backwards we did it the other way $f(x) \rightarrow -\infty$ as $x \rightarrow \infty$

16) $\frac{45v+72}{v^2+4v-21} \div \frac{45v+72}{2v+14}$

- A) $\frac{5v^2(v-8)}{(v+1)(v+2)}$
 B) $\frac{3v^2}{2v+14}$
 C) $\frac{8v}{7(v-4)}$
 D) $\frac{2}{v-3}$

18) $\frac{5x+3}{3x^2+15x+3} + \frac{3x}{3x^2+15x^2+5x+3}$

- A) $\frac{3x(x+5)}{x+2}$
 B) $\frac{x+1}{x+1}$
 C) $\frac{3x+1}{x^2+5x+1}$
 D) $\frac{x^3+5x^2+2x+1}{x(x+5)}$

20) $\frac{4}{p-4} - \frac{2}{p+5}$

- A) $\frac{-p-6-p^2}{3(p+6)}$
 B) $\frac{7p+28+p^2}{(p+5)(p-4)}$
 C) $\frac{2p+28}{2p+10}$
 D) $\frac{p-4}{p-4}$

17) $\frac{5a-1}{2a-2} \cdot \frac{(a-2)}{2a-2}$

- A) $\frac{4a-3}{a^2+3a-18}$
 B) $\frac{4a+1}{2a-2}$
 C) $\frac{10a}{a^2+3a-18}$
 D) $\frac{4a-2}{a^2+3a-18}$

$5x+3 + 3x(x+x+5)$
 $3x(x+5)$

19) $\frac{b-4}{3} + \frac{3b}{3b^2-9b}$

- A) $\frac{b^2-7b+15}{-10b-4+3b^2}$
 B) $\frac{3(b-3)}{3(1+b)}$
 C) $\frac{b^2-8b+16}{3}$
 D) $\frac{4b-14}{3}$

$4(p+5) - 2(p-4)$

- A) $\frac{1}{4}$
 B) $\frac{4}{u+4}$
 C) $\frac{u^2+10u+25}{16u+64}$
 D) $\frac{4}{u+5}$

22) $\frac{12}{a^2} - \frac{a+3}{16+4}$

- A) $\frac{12a}{a^2-3a}$
 B) $\frac{192}{a^3+12a^2}$
 C) $\frac{16a}{64+3a^2}$
 D) $\frac{3a^3+144}{3a^2}$

23) $\frac{1}{a} + \frac{4}{a^2} - \frac{1}{a}$

- A) $\frac{3a-25}{25-4a}$
 B) $\frac{8a+32}{8a-a^2}$
 C) $\frac{4a^2}{a^3-200}$
 D) $\frac{64a-25a^3}{16a+40a^2}$

discriminate

Common Denom.

$\frac{5a-1-a+2}{2a-2}$
 $\frac{4a-3}{2a-2}$

$\frac{b(b-4)(b-3) + 3b}{3b(b-3)}$

mult. by

* restrictions $n(n-6)$

Solve each equation. Remember to check for extraneous solutions.

- 24) $\frac{2}{3n^2} = \frac{1}{n^2} + \frac{1}{n^2}$ (3n²)
 A) {-1} B) {4}
 C) {1} D) {-3}
- 25) $\frac{1}{n} + \frac{4n+16}{n^2-6n} = \frac{4}{n-6}$
 A) {-4} B) {-10}
 C) {2} D) {0}

26) $\frac{r^2+7r+10}{r^2-1} - \frac{6}{r-1} = \frac{1}{r+1}$
 A) {-5} B) {0} C) {5} D) {0}

r^2-1

Evaluate each expression.

- 27) $\log_8 343$
 A) 48 B) $\frac{1}{3}$
 C) 3 D) -3
- 29) $\log_5 25$
 A) 2 B) $-\frac{1}{2}$
 C) 5 D) $\frac{1}{2}$
- 28) $\log_2 8$
 A) $\frac{1}{3}$ B) 4
 C) 3 D) -3
- 30) $\log_6 \frac{1}{36}$
 A) 2 B) $-\frac{1}{2}$
 C) -2 D) $\frac{1}{2}$

Expand each logarithm.

- 31) $\log_5 \frac{n^3}{n^2}$
 A) $\log_5 n + \log_5 n + \log_5 n$
 B) $3 \log_5 n + \log_5 n$
 C) $3 \log_5 n - 2 \log_5 n$
 D) $3 \log_5 n + 2 \log_5 n$
- 32) $\log_8 (a^6 b^7)$
 A) $\log_8 a + \log_8 b + 6 \log_8 c$
 B) $5 \log_8 a - 30 \log_8 b$
 C) $6 \log_8 a + 5 \log_8 b$
 D) $\log_8 a + \log_8 b + \log_8 c$

Condense each expression to a single logarithm.

- 33) $2 \log_4 x + 6 \log_4 y$
 A) $\log_4 \sqrt{2xy}$ B) $\log_4 \frac{x^6}{y^{12}}$
 C) $\log_4 (y^6 x^2)$ D) $\log_4 (2^2 \sqrt{x})$
- 34) $4 \log_8 10 - 2 \log_8 3$
 A) $\log_8 \sqrt[4]{330}$
 B) $\log_8 \frac{10^4}{3^2}$
 C) $\log_8 (3^2 + 10^4)$
 D) $\log_8 (11 \sqrt[4]{30})$

Solve each equation.

- 35) $\log_8 x = 4$
 A) {4096} B) {512}
 C) {1} D) {12}
- 36) $\log_8 8y = 9$
 A) $\left\{ \frac{11}{8} \right\}$ B) $\left\{ \frac{17}{6} \right\}$
 C) {27} D) {-3}

37) $-6 + 2 \log_9 (p+7) = -10$

$2 \log_9 (p+7) = -4$
 $\log_9 (p+7) = -2$
 $9^{-2} = p+7$
 $\frac{1}{81} = p + \frac{56}{8}$
 $p = -\frac{56}{8}$

Solve each equation. Round your answers to the nearest ten-thousandth.

- 38) $8^x = 79$
 A) 7.8976 B) 4.3694
 C) 2.1013 D) No solution.
- 39) $14^{-4} = 22.4$
 A) -0.2945 B) No solution.
 C) -0.7773 D) -0.3376
- 40) $-10 \cdot 14^{x-3} = -36.8$
 A) 3.5658 B) 3.7268
 C) 3.4937 D) 4.3029

Write the rule for the ARITHMETIC sequence.

- 41) ~~$a_1 = -160, -360, -560, \dots$~~
 A) $a_n = -160 + 200n$
 B) $a_n = 240 - 200n$
 C) $a_n = 242 - 202n$
 D) $a_n = 241 - 201n$
- 42) ~~$a_1 = 113, d = 6$~~
 A) $a_n = -3 - 6n$
 B) $a_n = -2 - 6n$
 C) $a_n = -13 + 6n$
 D) $a_n = -14 + 6n$