Algebra 2B
Final Exam Review 2

Name Key

Date _____ Period _____

C 1. If $f(x) = 3x^5 - 8x^4 - 2x^2 - 10x + 1$, find f(2)

A. –211 B. –123 C. –59 D. –65

	3	−8	0	−2	−10	1
2	↓	6	−4	−8	−20	−60
	3	−2	−4	−10	−30	−59

A 2. If x varies directly as y and $x = -20$ when $y = 4$, find y when $x = 8$.

A. –1.6 B. –5 C. –10 D. –40

$x = ky$
$-20 = k(4)$
$-5 = k$

$8 = -5y$
$-\frac{8}{5} = y$

B 3. What is the vertex of $y = 3x^2 + 6x - 2$

A. (–1, –2) B. (–1, –5) C. (–2, –2) D. (2, 22)

$x = \frac{-b}{2a} = \frac{-6}{2(3)} = \frac{-6}{6} = -1$

$y = 3(-1)^2 + 6(-1) - 2$
$= 3 - 6 - 2 = -5$

C 4. Find the maximum value of g if $g(x) = 7 - 8x - 2x^2$

(y value of vertex)

A. 7 B. –2 C. 15 D. –17

$g(x) = -2x^2 - 8x + 7$

$x = \frac{8}{2(-2)} = -2$

$g(-2) = 7 - 8(-2) - 8$
$= 7 + 16 - 8$
$= 15$

B 5. Find the nature of the roots of: $8x^2 + 2 = -10x$ *(Hint: use discriminant)*

A. 2 real irrational. roots
B. 2 real rational roots
C. 1 real rational double root
D. 2 imaginary conjugate roots

$8x^2 + 10x + 2 = 0$
$a = 8 \quad b = 10 \quad c = 2$

$10^2 - 4(8)(2)$
$100 - 64$
36

A 6. What is the y-intercept of the graph of $y = (x + 3)^2 - 2$

(x = 0)

A. 7 B. –2 C. –3 D. 3

$y = (3)^2 - 2$
$= 7$

D 7. Simplify: $\left(\frac{2x^2}{-y}\right)^4$

A. $-\frac{2x^8}{y^4}$ B. $\frac{2x^8}{y^4}$ C. $-\frac{16x^8}{y^4}$ D. $\frac{16x^8}{y^4}$

$\frac{16x^8}{y^4}$

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A 8. Simplify: $(3x^{-3}y^4)^{-2}$ $\frac{1}{9}x^6y^{-8} = \frac{x^6}{9y^8}$

A. $\frac{x^6}{9y^8}$ B. $\frac{-9x^6}{y^8}$ C. $\frac{-9y^2}{x^5}$ D. $\frac{y^8}{9x^6}$

D 9. Simplify: $(3x^2y)^0\,(2x)^{-3}$ $1(2x)^{-3} = \frac{1}{8x^3}$

A. $8x^3$ B. $\frac{-8}{x^3}$ C. $\frac{3y}{8x}$ D. $\frac{1}{8x^3}$

A 10. Simplify: $\frac{x^2-8x+15}{x^2-2x-3} \div \frac{25-x^2}{x+1} = \frac{-1(x-5)(x-3)}{(x-3)(x+1)} \cdot \frac{(x+1)}{(5-x)(5+x)}$

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

C 11. Simplify: $\frac{2}{2}\ \frac{1-x}{x^2} + \frac{2+x}{2x} \cdot \frac{x}{x}$ LCD: $2x^2$

A. $\frac{x+1}{x}$ B. $\frac{x^2+2}{2x^3}$ C. $\frac{x^2+2}{2x^2}$ D. $\frac{x+2}{2x}$

$\frac{2-2x}{2x^2} + \frac{2x+x^2}{2x^2} = \frac{2+x^2}{2x^2}$

D 12. Solve: $\frac{1}{x+2} + \frac{1}{x-1} = \frac{3}{x^2+x-2}$ $(x+2)(x-1)$

A. $\{-2, 1\}$ B. $\{2\}$ C. $\{1\}$ D. no solution

LCD: $(x+2)(x-1)$

$(x-1) + (x+2) = 3$

$2x + 1 = 3$

$2x = 2$ $x = 1$ $x \neq 1$

Answers:

1. C	3. B	5. B	7. D	9. D	11. C
2. A	4. C	6. A	8. A	10. A	12. D

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D 1. Find the vertex of $y = 2x^2 - 12x + 5$

$x = \frac{-b}{2a} = \frac{12}{2(2)} = 3$

A. (–3, 59) B. (3, 5) C. (6, 5) D. (3, –13)

$y = 2(3)^2 - 12(3) + 5$
$= 2(9) - 36 + 5$
$= 18 - 36 + 5 = -13$

C 2. Rewrite $y = 4x^2 + 8x - 5$ in $y = a(x - h)^2 + k$ form.

A. $y = (x+1)^2 - 9$ B. $y = 4(x-1)^2 - 9$ C. $y = 4(x+1)^2 - 9$ D. $y = 4(x+2)^2 - 5$

$y = 4(x^2 + 2x) - 5$
$\left(\frac{2}{2}\right)^2 = 1$
$y + 4 \cdot 1 = 4(x^2 + 2x + 1) - 5 \rightarrow y + 4 = 4(x+1)^2 - 5$
$-4 \qquad -4$
$y = 4(x+1)^2 - 9$

B 3. Determine whether $y = -x^2 - 8x + 2$ has a maximum or minimum value. Find the value.

max

A. max = –4 B. max = 18 C. min = –4 D. min = 18

$x = \frac{-8}{2(-1)} = -4$

$y = -(-4)^2 - 8(-4) + 2$
$y = -16 + 32 + 2$
$= 16 + 2 = 18$

B 4. Find the nature of the roots of $4x^2 + 3 = 7x$.

A. 2 real irrational roots B. 2 real rational roots
C. 1 real double root D. 2 imaginary conjugate roots

$4x^2 - 7x + 3 = 0$
$a = 4 \quad b = -7 \quad c = 3$

$b^2 - 4ac$
$(-7)^2 - 4(4)(3)$
$49 - 48 = 1$

A 5. What is the y-intercept of the graph of $y = 2(x - 1)^2 + 3$

$x = 0$

A. 5 B. 3 C. 2 D. 1

$y = 2(-1)^2 + 3$
$y = 2(1) + 3 = 5$

C 6. Mulitply: $(2x - 3)^2$

A. $4x^2 - 9$ B. $4x^2 + 9$ C. $4x^2 - 12x + 9$ D. $4x^2 + 12x + 9$

$(2x-3)(2x-3)$
$4x^2 - 6x - 6x + 9$
$4x^2 - 12x + 9$

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A 7. What is the axis of symmetry of the graph of the parabola $y = 3(x-2)^2 + 4$

A. $x = 2$ B. $x = -2$ C. $x = 4$ D. $x = 3$

C 8. What is the range of the parabola $y = -2(x-5)^2 + 4$

(h, k) (5, 4) down. Since negative.

A. $y \le -2$ B. $y \le 5$ C. $y \le 4$ D. $y \ge 4$

C 9. Which is NOT a rational number?

A. $1.\overline{35}$ B. $\frac{2}{7}$ C. $\sqrt{3}$ D. $\sqrt[3]{-8}$

repeats fraction -2

Answers:

1. D 2. C 3. B 4. B 5. A 6. C 7. A
8. C 9. C