

Name Kay

Date _____ Period _____

- B 1. Express as a single logarithm: $3\log_2 x - \log_2 y$ $\log_2 x^3 - \log_2 y = \log_2 \frac{x^3}{y}$
- A. $\log_2 \frac{3x}{y}$ B. $\log_2 \frac{x^3}{y}$ C. $\frac{\log_2 x^3}{\log_2 y}$ D. $\log_2 x^3 y$

- D 2. Solve for x: $\log_x 8 = \frac{3}{2}$ $(x^{\frac{2}{3}})^3 = (8)^{\frac{2}{3}}$
 $x = 2^2 = 4$
- A. $8\sqrt{8}$ B. 12 C. $\frac{16}{3}$ D. 4

- C 3. Solve for x: $\log_3 x + \log_3 (x+2) = \log_3 8$
- A. $\{-4, 2\}$ B. $\{4, -2\}$ C. $\{2\}$ D. $\{4\}$
- $x^2 + 2x - 8 = 0$
 $(x+4)(x-2) = 0$ ~~$x = -4$~~ $x = 2$

- B 4. Solve for x: $\log_2 x - \log_2 4 = 3$ can't have neg log value.
- A. 7 B. 32 C. 12 D. 24
- $\log_2 \frac{x}{4} = 3$
 $2^3 = \frac{x}{4}$ $(4)8 = \frac{x(4)}{4}$ $32 = x$

- D 5. Find the minimum value of $y = x^2 - 8x + 3$ $x = \frac{-b}{2a} = \frac{8}{2(1)} = 4$
- A. 4 B. -4 C. 3 D. -13
- $y = (4)^2 - 8(4) + 3$
 $y = 16 - 32 + 3 = -16 + 3 = -13$

- B 6. Use synthetic division to find the remainder when $x^4 + 4x^3 - 5x + 3$ is divided by $x + 2$
- A. 21 B. -3 C. 41 D. 17

$$\begin{array}{r|rrrrr} -2 & 1 & 4 & 0 & -5 & 3 \\ & \downarrow & -2 & -4 & 8 & -6 \\ \hline & 1 & 2 & -4 & 3 & -3 \end{array}$$

$x = ky$

C 7. If x varies directly as y and $x = 21$ when $y = 12$, find x when $y = 28$.

A. 9 B. 16 C. 49 D. 54

$\frac{21}{12} = \frac{k(12)}{12}$ $k = \frac{7}{4}$ $x = \frac{7}{4}(28) = 49$

A 8. Find the center and radius of the circle:
 $x^2 + y^2 - 8x + 4y + 12 = 0$

A. (4, -2); $2\sqrt{2}$ B. (-4, 2); $2\sqrt{2}$ C. (4, -2); $2\sqrt{3}$ D. (-4, 2); $2\sqrt{3}$

$(\frac{-8}{2})^2 = 16$
 $(\frac{4}{2})^2 = 4$

$x^2 - 8x + y^2 + 4y = -12$
 $(x^2 - 8x + 16) + (y^2 + 4y + 4) = -12 + 16 + 4$
 $(x-4)^2 + (y+2)^2 = 8$ $r^2 = 8$ $r = 2\sqrt{2}$ (4, -2)

9. Identify the conic: $x^2 - 4y^2 - 2x - 16y - 11 = 0$

- A. Circle B. Ellipse C. Hyperbola D. Parabola

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

$x^2 - 2x - 4y^2 - 16y = 11$
 $(x-1)^2 - 4(y^2 + 4y) = 11 + 1$
 $(x-1)^2 - 4(y+2)^2 = 11 + 1 + 4$
 $\frac{(x-1)^2}{16} - \frac{4(y+2)^2}{16} = \frac{16}{16}$
 $\frac{(x-1)^2}{16} - \frac{(y+2)^2}{4} = 1$

Answers:

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

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Use the parabola $y = -3(x + 2)^2 - 4$ for problems 1 - 3.

- B 1. Find the vertex. $(-2, -4)$ ^{h k}
- A. $(-4, -2)$ B. $(-2, -4)$ C. $(2, -4)$ D. $(-4, 2)$

- D 2. Find the direction of opening.
- A. left B. right C. up D. down

- B 3. Determine if it has a minimum or maximum value and find the value. ^(negative)
- A. maximum; -2 B. maximum; -4 C. minimum; -2 D. minimum; -4
- Max* \downarrow

- D 4. Simplify: $i^3 \cdot i^{15} = i^{18} = i^{16} \cdot i^2 = 1 \cdot -1 = -1$
- A. i B. $-i$ C. 1 D. -1

- C 5. Write the quadratic equation with roots -5 and 9 .

- A. $x^2 + 4x - 45 = 0$ B. $x^2 + 4x + 45 = 0$ C. $x^2 - 4x - 45 = 0$ D. $x^2 - 4x + 45 = 0$

$$(x+5)(x-9) = 0$$

$$x^2 - 4x - 45 = 0$$

- A 6. One endpoint of a segment is $(-2, 3)$. If its midpoint is $(4, 5)$, find the other endpoint.
- x_1, y_1 x_m, y_m

- A. $(10, 7)$ B. $(-8, 1)$ C. $(1, 4)$ D. $(-3, -1)$

$$4 = \frac{-2+x}{2} \quad 5 = \frac{3+y}{2}$$

$$8 = -2+x \quad 10 = 3+y$$

$$10 = x \quad (10, 7) \quad 7 = y$$

$$\frac{x^2}{25} + \frac{y^2}{4} = 100$$

- B 7. What are the x-intercepts and y-intercepts for the ellipse $\frac{4x^2}{100} + \frac{25y^2}{100} = \frac{100}{100}$
- A. $(\pm 2, 0)(0, \pm 5)$ B. $(\pm 5, 0)(0, \pm 2)$ C. $(\pm 10, 0)(0, \pm 10)$ D. $(\pm 4, 0)(0, \pm 25)$

- D 8. Evaluate: $e^{\ln 2}$ $\log_e e^2 = 2$
- A. e^2 B. $\ln 2$ C. \sqrt{e} D. 2

- C 9. Solve: $\frac{2(x-1)^2}{2} = \frac{-16}{2}$ $\sqrt{(x-1)^2} = \sqrt{-8}$
 $x-1 = \pm 2\sqrt{2}$ $x = 1 \pm 2\sqrt{2}$
- A. $\{1+2i, 1-2i\}$ B. $\{1+2\sqrt{2}, 1-2\sqrt{2}\}$ C. $\{1+2i\sqrt{2}, 1-2i\sqrt{2}\}$ D. $\{1-i\sqrt{2}, 1+i\sqrt{2}\}$

- C 10. Simplify: $\frac{2}{\sqrt[3]{8}}$ $\frac{2}{(2^3)^{1/3}} = \frac{2}{2^1} = 2$
- A. $\frac{1}{\sqrt{2}}$ B. $\frac{1}{2}$ C. $\sqrt{2}$ D. $\sqrt[3]{4}$

- B 11. Solve: $\frac{2(x-2)}{x+2} + \frac{x^2}{x^2-4} = \frac{1(x+2)}{x-2}$ LCD: $(x-2)(x+2)$
- A. $\{-3, 2\}$ B. $\{-3\}$ C. $\{-2, 3\}$ D. $\{3\}$

$2x-4+x^2 = x+2$ $x^2+x-6=0$
 $x^2+2x-4 = x+2$ $(x+3)(x-2)=0$
 $x=-3$ $x=2$

- C 12. Simplify: $\frac{x-1}{x+1} - \frac{x^2-x-6}{x^2+4x+3}$
- A. $\frac{1}{x+1}$ B. $\frac{2x^2+x-9}{(x+1)(x+3)}$ C. $\frac{3}{x+3}$ D. $\frac{x-9}{(x+1)(x+3)}$
- $\frac{(x+3)(x-1) - (x-3)(x+2)}{(x+1)(x+3)}$ $\frac{x^2+2x-3 - (x^2-x-6)}{(x+1)(x+3)} = \frac{3x+3}{(x+1)(x+3)} = \frac{3(x+1)}{(x+1)(x+3)} = \frac{3}{x+3}$

Algebra 2B
Final Exam Review 5

B 13. Evaluate: $\log_3 \frac{1}{81}$ $3^x = \frac{1}{81}$ $3^x = \frac{1}{3^4}$ $3^x = 3^{-4}$
 $x = -4$
 A. 4 B. -4 C. 27 D. -27

D 14. What is the slope of the line perpendicular to $3x - 2y = 6$?
 $-2y = -3x + 6$
 $y = \frac{3}{2}x - 3$
 A. $\frac{3}{2}$ B. $-\frac{3}{2}$ C. $\frac{2}{3}$ D. $-\frac{2}{3}$

D 15. What is the slope of the line passing through $(1, -3)$ and $(1, 2)$?
 A. 1 B. 5 C. 0 D. undefined slope
 $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - (-3)}{1 - 1}$

D 16. Find the number of zeros: $f(x) = (x^2 - 4)(x^2 - 9)$
 A. 0 B. 2 C. 3 D. 4

D 17. Evaluate $\left(\frac{3}{4}\right)^{-3}$ $\left(\frac{4}{3}\right)^3 = \frac{64}{27}$
 A. $\frac{27}{64}$ B. $-\frac{27}{64}$ C. $-\frac{9}{12}$ D. $\frac{64}{27}$

D 18. Write as a single logarithm: $\frac{1}{2}\log_2 M - 3\log_2 N = \log_2 M^{\frac{1}{2}} - \log_2 N^3$
 A. $\frac{\log_2 \sqrt{M}}{\log_2 N^3}$ B. $\log_2 \frac{M}{6N}$ C. $\log_2 \frac{\sqrt{M}}{3N}$ D. $\log_2 \frac{\sqrt{M}}{N^3}$

Answers:

- | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|
| 1. B | 2. D | 3. B | 4. D | 5. C | 6. A | 7. B |
| 8. D | 9. C | 10. C | 11. B | 12. C | 13. B | 14. D |
| 15. D | 16. D | 17. D | 18. D | | | |

