1) Solve the inequality: $6|3x-4|-5 \geq 25$

   A) $[3,\infty)$

   B) $\left(-\infty, -\dfrac{1}{3}\right]$

   C) Both A and B are correct.

   D) $\left[-\dfrac{1}{3}, 3\right]$

   E) No Solution

2) Solve for $x$: $Ax + By = C$

   A) $x = \dfrac{C}{A} - \dfrac{B}{A}y$

   B) $x = \dfrac{C}{A} - By$

   C) $x = C - \dfrac{B}{A}y$

   D) $x = A(C - By)$

   E) None of the Above are correct

3) Which of the following is a transcendental number?

   A) $\sqrt{7}$          B) $\sqrt{9}$          C) $3i$          D) $e$          E) $\dfrac{2}{5}$

4) Solve: $2x + 3 > -15$ or $-2(x-5) + 7 > -21$

   A) No Solution          B) $(-\infty, \infty)$          C) $(-9, 19)$          D) $(-9, \infty)$          E) $(-\infty, 19)$

5) A projectile is launched from ground level with equation $s(t) = -16t^2 + 256t$. Find the maximum height of the projectile.

   A) 64 feet          B) 128 feet          C) 256 feet          D) 512 feet          E) 1024 feet

6) If $f(x) = x^3 - 3x$ and $g(x) = \sqrt{x+5}$, find $(f \circ g)(11)$.

   A) 52          B) 116          C) 188          D) 256          E) Not Given

7) Suppose $g(x) = 3\sqrt{x-2} + 4$. Find $g^{-1}(5)$.

   A) 2          B) 7/3          C) 19/9          D) $3\sqrt{3} + 4$          E) Not Given

8) Solve for $x$: $x^3 - 3x^2 + 4x = 12$.

   A) $x = 2, \pm 3i$          B) $x = -2, \pm 3i$          C) $x = 3, \pm 2i$          D) $x = -3, \pm 2i$          E) Not Given

9) Solve for $x$: $x^4 + 24x^2 - 25 = 0$.

A) $x = \pm 1, \pm 5$      B) $x = \pm i, \pm 5$      C) $x = \pm 1, \pm 5i$      D) $x = \pm i, \pm 5i$      E) Not Given

10) Solve for $x$: $\dfrac{1}{x-2} + \dfrac{2x}{x-3} = \dfrac{x+11}{x-2}$.

A) $x = 5$ only      B) $x = 6$ only      C) $x = 5$ & $x = 6$      D) No Solution      E) Not Given

11) Simplify: $(3 - 2i)(6 + 5i)$

A) $28 - 3i$      B) $28 + 3i$      C) $-28 + 3i$      D) $-28 - 3i$      E) Not Given

12) Find the two imaginary roots of $f(x) = x^4 + x$.

A) $\dfrac{1 \pm i\sqrt{3}}{2}$      B) $\dfrac{-1 \pm i\sqrt{3}}{2}$      C) $2 \pm i\sqrt{3}$      D) $-2 \pm i\sqrt{3}$      E) Not Given

13) Suppose $f(x) = \dfrac{x^2 - 8x + 7}{x^2 - 5x - 14}$. Find the equations of both the horizontal and vertical asymptotes of the function.

A) $x = -2, y = 1$      B) $x = -2, y = 7$      C) $x = 7, y = 1$      D) $x = -2, y = 0$      E) Not Given

14) Suppose $f(x) = \dfrac{x-3}{x+4}$ and $g(x) = \dfrac{x-4}{x+3}$. The function $\dfrac{f}{g}(x)$ excludes which numbers from its domain?

A) 3, 4, -4      B) -3, 4, -4      C) 4, -4      D) 3, -3, 4      E) 3, -3, -4

15) Suppose $g(x) = \dfrac{x-4}{x+3}$. Find $g^{-1}(x)$.

A) $g^{-1}(x) = \dfrac{3x+4}{1-x}$    B) $g^{-1}(x) = \dfrac{3x-4}{1+x}$    C) $g^{-1}(x) = \dfrac{3x-4}{1-x}$    D) $g^{-1}(x) = \dfrac{3x+4}{1+x}$    E) Not Given

16) Solve for $x$: $\log_3(x-2) + \log_3(2x-1) = 3$

A) -5/2      B) 5      C) -5      D) 5/2      E) A and B

17) The equation $x^2 + 3x + 2y^2 + 6y = 9$ represents what conic section?

A) Circle      B) Hyperbola      C) Cone      D) Parabola      E) Ellipse

18) Suppose $a_n = 3n+4$. Compute $\displaystyle\sum_{n=1}^{5} a_n$.

    A) 25             B) 35             C) 45             D) 55             E) 65

19) Find the $83^{rd}$ term of the sequence $\{986, 979, 972, \ldots\}$.

    A) 440            B) 433            C) 426            D) 419            E) 412

20) Find the radius of the circle: $x^2 + 6x + y^2 - 10y = 14$.

    A) (3, 5)         B) (-3, -5)        C) (3, -5)        D) (-3, 5)        E) Not Given

21) Solve for $x$: $(7x-1)^{2/3} = 9$.

    A) 4            B) -26/7       C) Both A and B     D) 29/14       E) -29/14

22) Solve for $x$: $\sqrt{x+5} < 2$.

    A) $(-\infty, -1)$      B) $(-\infty, \infty)$      C) $(-5, -1]$      D) $[-5, -1)$      E) $(-5, -1)$

23) What interest rate is required to double an investment, compounded quarterly, over a 10-year period?

    A) 5%            B) 6%            C) 7%            D) 8%            E) 9%

24) Find the vertex of the parabola: $-x + y^2 - 16y = 0$.

    A) (64, 8)        B) (-64, 8)       C) (-64, -8)      D) (64, -8)      E) not given

25) Give the range of the function: $f(x) = -2(5)^x + 3$.

    A) $[3, \infty)$       B) $(-\infty, 3]$      C) $(3, \infty)$      D) $(-\infty, 3)$      E) not given

26) Solve for $w$: $w^2 + 2w = x$.

    A) $w = -1 \pm \sqrt{x+1}$    B) $w = 1 \pm \sqrt{x+1}$    C) $w = 1 \pm \sqrt{x-1}$    D) $w = -1 \pm \sqrt{x-1}$    E) not given

27) Solve for $A$: $\begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix} \begin{bmatrix} A & -3 \\ 5 & 1 \end{bmatrix} = \begin{bmatrix} 3 & -1 \\ 1 & -3 \end{bmatrix}$.

    A) -7            B) -5            C) -3            D) -1            E) not given

28) The distance between points A and B is 10 units.  If point A is located at (4, -2) and point B is located (12, $x$), what are the possible values of $x$?

A)  4 and 8                    B)  -4 and -8                    C)  -4 and 8                    D)  4 and -8                    E) not given

29) A parabola has vertex (3, -2) and y-intercept (0, 8).  Which of the following gives the equation of the parabola?

A)   $y = (x-3)^2 - 2$                    B)  $y = \dfrac{10}{9}(x-3)^2 - 2$                    C)  $y = -\dfrac{10}{9}(x-3)^2 - 2$

D)  $y = -\dfrac{10}{9}(x+3)^2 - 2$                    E)  $y = \dfrac{10}{9}(x+3)^2 - 2$

30) An exponential function passes through the points (0, 2) and (1, 5) and has a horizontal asymptote y = 1.  Find the equation of the exponential function.

A)   $y = 2^x + 3$                    B)  $y = 3^x + 2$                    C)  $y = 4^x + 1$

D)   $y = 2^{2x} + 1$                    E)  Either C or D is correct

31)  Suppose $x$ is inversely related to the square of $y$.  If $x = 4$ when $y = 5$, then when $y = 2$, what does $x$ equal?

A)  5                    B)  10                    C)  15                    D)  20                    E)  25

32)  Line R passes through the points (3, 8) and (3, 13).  Find the slope of the line perpendicular to line R.

A)  5                    B)  1/5                    C)  0                    D)  -1/5                    E) Undefined

33)  A cubic function has been vertically stretched by a factor of 2, translated left 3 units and translated up 14 units.  Which of the following points is on the graph of the cubic function?

A)  (-5, -2)                    B)  (-4, 10)                    C)  (-3, 16)                    D)  (-2, 18)                    E)  (-1, 32)

34)  Which of the following functions has a removable discontinuity?

A)   $y = \dfrac{1}{x}$          B)  $y = \dfrac{x^2+4}{x^2-4}$          C)  $y = \dfrac{x^2-1}{x^2-5x+6}$          D)  $y = \dfrac{x^2-1}{x^2+8x-9}$          E)  B and D

35)  Which of the following functions has a vertical asymptote at $x = 1$?

A)   $y = e^x + 1$          B)  $y = \dfrac{x^2-1}{x^2+1}$          C)  $y = \dfrac{x^2+3x-4}{x^2-1}$          D)  $y = \dfrac{x^2-3x-4}{x^2-1}$          E)  C and D

36) Suppose $f(x) = \dfrac{1}{x}$. Describe the graph of $f(f(x))$.

    A) Rational function with graph $y = \dfrac{1}{x^2}$.

    B) Quadratic function with graph $y = x^2$.
    C) Linear function with graph $y = x$.
    D) Linear function with graph $y = x$ and a vertical asymptote at $x = 0$.
    E) Linear function with graph $y = x$ and a removable discontinuity at $x = 0$.

37) Suppose the vertex angle of an isosceles triangle is fifteen more than three times than the measure of a base angle. Find the measure of the vertex angle.

    A) 33        B) 83        C) 92        D) 103        E) 114

38) How many solutions does the system of equations have? $\begin{cases} x^2 + y^2 = 100 \\ y = x^2 - 12 \end{cases}$

    A) 0        B) 1        C) 2        D) 3        E) 4

39) Find the value of k that gives the equation $\displaystyle\sum_{n=0}^{2}(x-n)^2 = k$ exactly one solution.

    A) 0        B) 1        C) 2        D) 3        E) 4

40) The fifth term of a geometric sequence is 84, and the ninth term is 21/64. Find the second term.

    A) 336        B) 1344        C) 5376        D) 21504        E) answer not given