Problem 1

$(-5)(-7) + (-16) =$

- **A.** -28
- **B.** 51
- **C.** -35
- **D.** 19
- **E.** -51

Problem 2

$5\frac{1}{4} - 2\frac{2}{3} =$

- **A.** $2\frac{7}{12}$
- **B.** $3\frac{7}{12}$
- **C.** 2
- **D.** $3\frac{5}{12}$
- **E.** 4

Problem 3

If 7 is subtracted from 3.6, then the result is:

- **A.** 4.6
- **B.** 3.4
- **C.** 2.9
- **D.** -3.4
- **E.** -2.9

Problem 4

Sara receives a 7% salary increase. If Sara's salary was $\$14,000$ before the raise, what is her new salary to the nearest dollar?

- **A.** \$16,000
- **B.** \$98,000
- **C.** \$980
- **D.** \$16,980
- **E.** \$2,000

Problem 5

If $C = \frac{5}{9}(F - 32)$ and $F = 50$, then $C =$

- **A.** 18
- **B.** 58
- **C.** -4.2
- **D.** 32.4
- **E.** 10

Problem 6

If $x - 3(x - 6) = 5(x + 1) - 7$, then $x =$

- **A.** $\frac{12}{7}$
- **B.** $-\frac{16}{7}$
- **C.** $\frac{20}{7}$
- **D.** $\frac{8}{7}$
- **E.** 0

Problem 7

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

- **A.** $48x^8$
- **B.** $-48x^8$
- **C.** $144x^{14}$
- **D.** $48x^{12}$
- **E.** $-12x^8$

Problem 8

$(7x^3 - 8x^2 + 3x + 1) - (8x^3 + 7x^2 - 2) =$

- **A.** $-x^3 - x^2 + 3x - 1$
- **B.** $-x^3 - 15x^2 - 3x + 1$
- **C.** $15x^3 - x^2 + 3x - 1$
- **D.** $-x^3 - 15x^2 + 3x + 3$
- **E.** $-x^3 - 15x^2 + 5x + 1$

Problem 9

One of the factors of $15x^2 - 7x - 2$ is:

- **A.** $3x + 2$
- **B.** $3x - 2$
- **C.** $3x + 1$
- **D.** $5x - 1$
- **E.** $15x - 1$

Problem 10

$\dfrac{x^2 - 9}{x^2 - 6x + 9} =$

- **A.** $\frac{-9}{-6x+9}$
- **B.** 1
- **C.** $\frac{1}{9x}$
- **D.** 0
- **E.** $\frac{x+3}{x-3}$

Problem 11

$$\frac{2x}{x^2-9} - \frac{1}{x+3} =$$

- **A.** $x+3$
- **B.** $\frac{1}{x+3}$
- **C.** $\frac{2x-1}{x^2-9}$
- **D.** $\frac{2x+1}{x^2-x-6}$
- **E.** $\frac{1}{x-3}$

Problem 12

$(-5)(-7) + (-16) =$

- **A.** -28
- **B.** 51
- **C.** -35
- **D.** 19
- **E.** -51

Problem 13

$(-5)(-7) + (-16) =$

- **A.** -28
- **B.** 51
- **C.** -35
- **D.** 19
- **E.** -51

Problem 14

In the system of equations

$$\begin{cases} 2x + 3y = 7 \\ 2x - 3y = 4 \end{cases}$$

- **A.** $x = \frac{3}{4}$
- **B.** $x = \frac{11}{4}$
- **C.** $x = \frac{1}{2}$
- **D.** $x = \frac{11}{2}$
- **E.** $x = 11$

Problem 15

$\sqrt{25x} + 4\sqrt{x} =$

- **A.** $4\sqrt{26x}$
- **B.** $\sqrt{29x}$
- **C.** $5\sqrt{26x}$
- **D.** $9\sqrt{x}$
- **E.** $\sqrt{41x}$

Problem 16

$\sqrt{44p^{12}q^8} =$

- **A.** $2p^6q^4\sqrt{11}$
- **B.** $22p^6q^4$
- **C.** $2p^{10}q^6\sqrt{11}$
- **D.** $2p^6q^4$
- **E.** $22p^{12}q^8$

Problem 17

The solutions of the quation $3x^2 - 7x - 6 = 0$ are:

- **A.** -3 and $-\frac{2}{3}$
- **B.** 3 and $-\frac{2}{3}$
- **C.** -3 and $\frac{2}{3}$
- **D.** 3 and -2
- **E.** 3 and $\frac{2}{3}$

Problem 18

One of the solutions of the equation $x^2 + 2x = -5$ is:

- **A.** $-1 + 2i$
- **B.** $2i$
- **C.** -5
- **D.** -7
- **E.** 19

Problem 19

If $y > 4$ then $|4 - y| =$

- **A.** $4 - y$
- **B.** $4 + y$
- **C.** $-4 + y$
- **D.** 0
- **E.** $-4 - y$

Problem 20

Which of the following are factors of $x^4 - 81$?
I. $x - 3$
II. $x + 3$
III. $x^2 + 9$

- **A.** III only
- **B.** I only
- **C.** II only
- **D.** I, II, and III
- **E.** I and II only

Problem 21

If $f(x) = x^2 - 5$ and $g(x) = 3x + 1$, then $f(g(2)) =$

- **A.** 44
- **B.** -1
- **C.** -2
- **D.** -7
- **E.** 2

Problem 22

The graph of the system of equations

$$\begin{cases} x + 2y = 1 \\ 4x - 8y = 4 \end{cases}$$

consists of:

- **A.** Two lines intersecting where x = 1.
- **B.** Two lines intersecting where x = 4.
- **C.** Two distinct parallel lines.
- **D.** Two lines intersecting where y = 3.
- **E.** One line.

Problem 23

The inequality $x^2 - 5x - 6 < 0$ is equivalent to:

- **A.** $-1 < x < 6$
- **B.** $x < -1$ or $x > 6$
- **C.** $x < 2$ or $x > 3$
- **D.** $-2 < x < 3$
- **E.** $2 < x < 3$

Problem 24

The distance between the points $(5, 2)$ and $(9, -1)$ is:

- **A.** 4
- **B.** 5
- **C.** 25
- **D.** 7
- **E.** $\sqrt{17}$

Problem 25

The logarithmic form of $5^3 = 125$ is:

- **A.** $\log_5 3$
- **B.** $\log_3 5$
- **C.** $\log_{125} 5 = 3$
- **D.** $\log_3 125 = 5$

- **E.** $\log_5 125 = 3$

Problem 26

Which angle measured in radians best describes the angle whose degree measure is 105°?

- **A.** $\frac{5}{12}\pi$
- **B.** $\frac{12}{17}\pi$
- **C.** $\frac{19}{12}\pi$
- **D.** $\frac{17}{12}\pi$
- **E.** $\frac{7}{12}\pi$

Problem 27

$\cos(90 - t)$ can be written as:

- **A.** $\cos(t)$
- **B.** $-\sin(t)$
- **C.** $1 - \sin(t)$
- **D.** $\sin(t)$
- **E.** $-\cos(t)$

Problem 28

When the angle of inclination of the sun is 60, the shadow cast by a tree is 12ft. How tall is the tree?

- **A.** 6ft
- **B.** 12ft
- **C.** $4\sqrt{3}$ft
- **D.** $12\sqrt{3}$ft
- **E.** $6\sqrt{2}$ft

Problem 29

If $\cos(t) = -\frac{12}{13}$ and $180 \leq t \leq 270$, then $\sin(t) =$

- **A.** $-\frac{5}{12}$
- **B.** $-\frac{1}{13}$
- **C.** None of these
- **D.** $-\frac{5}{13}$
- **E.** $-\frac{11}{12}$

Problem 30

$\sec^2(t)\cot(t)\cos(t)$ can also be written as:

- **A.** $\sec(t)\sin(t)$
- **B.** $\csc(t)$
- **C.** $\cos(t)$
- **D.** $\sec(t)$
- **E.** $\tan(t)$

Problem 31

If $0 < t < 90$ and $\cos(t) - \frac{4}{5}$, then $\cos(2t) =$

- **A.** $\frac{3}{5}$
- **B.** $\frac{1}{5}$
- **C.** $\frac{24}{25}$
- **D.** $\frac{7}{25}$
- **E.** $\frac{1}{25}$

Problem 32

The equation of a line passing through $2, -1$ and perpendicular to $2x + y - 3 = 0$ can be written as:

- **A.** $x + 2y = 0$
- **B.** $2x - y - 5 = 0$
- **C.** $x - 2y - 1 = 0$
- **D.** $x - 2y - 4 = 0$
- **E.** $2x + y - 3 = 0$

Problem 33

Find the slope and y-intercept of the line passing through the points $(2, 0), (3, 5)$.

- **A.** slope 1, y-intercept 2
- **B.** slope 2, y-intercept 1
- **C.** slope -1, y-intercept 2
- **D.** slope -1, y-intercept 1.5
- **E.** slope -1, y-intercept 8

Problem 34

Find the center C and the radius r of the circle represented by the equation $x^2 + y^2 - 8x + 16y + 55 = 0$

- **A.** $r : \sqrt{55}, C : (8, -16)$
- **B.** $r : 5, C : (-4, 8)$
- **C.** $r : 55, C : (-8, 16)$
- **D.** $r : 5, C : (4, -8)$
- **E.** $r : 25, C : (-4, 8)$

Problem 35

The graph of the equation $\frac{(x-2)^2}{2}+\frac{(y+1)^2}{4}=1$ is best described by:

- **A.** a hyperbola
- **B.** the point $(2,1)$
- **C.** a parabola
- **D.** an ellipse
- **E.** a circle

Problem 36

Using the properties of the log function, the expression $3\log(2x)-2\log(2x^2)$ can be written as:

- **A.** $\log(6x-4x^2)$
- **B.** $\log(\frac{2}{x})$
- **C.** $\log(2x)$
- **D.** $\frac{\log(8x^3)}{\log(4x^4)}$
- **E.** $\log\frac{3}{2x}$