Math Placement Sample

Question 1: (1 points)

$$\frac{2x}{x^2-16} - \frac{1}{x-4} =$$

- $\frac{2x-1}{x^2-16}$
- $\frac{1}{x-4}$
- $x-4$
- $\frac{2x-1}{x^2-x-12}$
- $\frac{1}{x+4}$

Question 2: (1 points)

$$\frac{6}{\sqrt{10\,x}} =$$

- $\frac{\sqrt{15\,x}}{5\,x}$
- $\frac{3\sqrt{5\,x}}{5\,x}$
- $\frac{3\sqrt{10\,x}}{5\,x}$
- $\frac{\sqrt{5\,x}}{3}$
- $\frac{\sqrt{10\,x}}{6}$

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Question 3: (1 points)

If $3x + 2 = 5y + 4$ then $y =$

- $\frac{3x - 2}{5}$
- $\frac{5x + 2}{3}$
- $\frac{1}{5}$
- $-\frac{3x - 2}{5}$
- $\frac{3x + 6}{5}$

Question 4: (1 points)

The positive root of the equation $x^2 + 10 = 29$ lies between

- 4 and 5
- 9 and 10
- 6 and 7
- 1 and 3
- 5 and 6

Question 5: (1 points)

One of the factors of $35x^2 - 8x - 3$ is

- $7x + 1$
- $7x - 3$
- $7x + 3$
- $35x - 1$
- $5x - 1$

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Question 6: (1 points)

Graph the equation $-3x - 2y = 6$

Question 7: (1 points)

Graph $y = |x - 2|$

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Question 8: (1 points)

If $f(x) = x^2 - kx - 1$ and $f(2) = -5$, then $k=$

- -5
- -4
- 2
- 4
- 1

Question 9: (1 points)

$$\frac{1}{1+\sqrt{5}} =$$

- $\frac{1+\sqrt{5}}{4}$
- $-\frac{1+\sqrt{5}}{24}$
- $\frac{-1+\sqrt{5}}{4}$
- $\frac{-1+\sqrt{5}}{24}$
- $\frac{1-\sqrt{5}}{4}$

Question 10: (1 points)

If, for all values of x, $(x-k)^2 = k^2 + 2x + x^2$, then $k=$

- -2
- 1
- 0
- 2
- -1

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Question 11: (1 points)

If $f(x) = x^2 + 1$ and $h(x) = 4x + 2$, then $f(h(3)) =$

- 10
- 140
- 42
- 15
- 197

Question 12: (1 points)

The graph of the system of equations $\begin{cases} x - 2y = 1 \\ 3x + 6y = 3 \end{cases}$ consists of

- two lines intersecting where $y = 3$.
- one line.
- two distinct parallel lines.
- two lines intersecting where $x = 3$.
- two lines intersecting where $x = 1$.

Question 13: (1 points)

If $\log_{10} x = 3$, then $x =$

- 1,000
- $\frac{1}{1,000}$
- 100
- 10
- $\frac{3}{10}$

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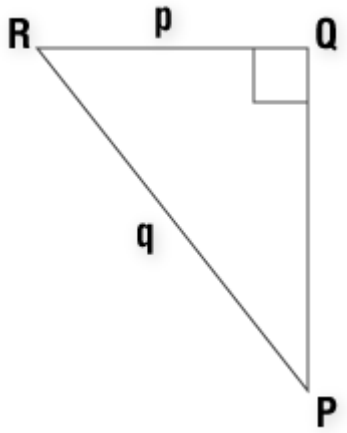
Question 14: (1 points)

In the figure shown below, if $\sin(P) = 0.37$ and $p = 4$, then $q =$



- $4(0.37)$
- $\frac{4}{5}$
- $\frac{4}{0.37}$
- 5
- Insufficient information is given to solve this problem.

Question 15: (1 points)

$\sin(90^o - \theta) =$

- $\sin(\theta)$
- $\cos(\theta)$
- $-\sin(\theta)$
- $1+\cos(\theta)$
- $-\cos(\theta)$

Question 16: (1 points)

For all real numbers x, $\cos^2(4x) + \sin^2(4x) =$

- 1
- 0
- $\sin(8x)$
- 4
- $\cos(8x)$

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Question 17: (1 points)

For which value(s) of x in the interval $0 \leq x \leq 2\pi$ does $(\cos(x) - 1)(\cos(x) - 3) = 0$?

- ☐ 1 and 3
- ☐ $\frac{\pi}{2}$
- ☐ π
- ☐ 0 and 2π
- ☐ $\frac{\pi}{2}$ and $\frac{3\pi}{2}$

Question 18: (1 points)

Recall that for the triangle ABC the law of cosines states that $a^2 = b^2 + c^2 - 2bc\cos(A)$ where a is the length of the side opposite angle A, b is the length of the side opposite angle B, and c is the length of the side opposite angle C.
In the triangle shown in the figure below, what is $\cos(P)$?
Note: The figure is not drawn to scale.

- ☐ $\frac{55}{64}$
- ☐ $\frac{5}{8}$
- ☐ $\frac{4}{5}$
- ☐ $\frac{73}{80}$
- ☐ $\frac{23}{40}$

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Question 19: (1 points)

If $f(x) = -2^x + x^2$, then $f(-1) =$

- 3
- $\frac{1}{2}$
- $-\frac{3}{2}$
- $-\frac{1}{2}$
- $\frac{3}{2}$

Question 20: (1 points)

$\log_5\left(\frac{1}{25}\right) =$

- 5
- -2
- 2
- -5
- $\frac{1}{2}$