Mathematics Entry Exam Topics

The exam contains 30 multiple-choice questions to be solved in 45 minutes. A basic calculator will be provided .The test will cover Basic Algebra and Pre-Calculus topics as follows:

Topics in Basic Algebra **[10 questions]**

1. **Factorization and Simplifying rational expressions** [3 questions]
2. **Inequalities(Simple, rational and quadratic)** [3 questions]
3. **Solving linear and rational equations** [4 questions]

Topics in Pre-Calculus **[20 questions]**

1. **Straight line equations** [3 questions]
2. **Polynomials (domain, inverse and factor and remainder theorem)**[6 questions]
3. **Trigonometry** [3 questions]
4. **Logarithmic and Exponential equations** [4 questions]
5. **Derivative rules** [2 questions]
6. **Basic Integration** [2 questions]

Mathematics Entry Exam
Sample Questions

1. $\dfrac{2x^2+10x-48}{8x+64}=$

   a) $\dfrac{x-3}{4}$

   b) $\dfrac{x+3}{8}$

   c) $x-3$

   d) $x+8$

2. $\dfrac{3x^2-39x+90}{x^2-3x-70}$

   a) $\dfrac{3x+3}{x+7}$

   b) $\dfrac{3x+9}{x+7}$

   c) $\dfrac{3x-9}{x+7}$

   d) $\dfrac{x-3}{x+7}$

3. If the line $ay+bx=6$ passes through the points (0, 3), (2, 0). The values of a, *and* b *are* :

   a) $a=3,\ b=2$

   b) $a=2, b=3$

   c) $b=-2, a=-3$

   d) $a=-2,\ b=-3$

4. Solve $\frac{2}{x-1}-\frac{1}{x}=\frac{3}{x^2-x}$

a) $x=2$

b) $x=4$

c) $x=-2$

d) $x=3$

5. Solve $\frac{x}{x-3}\le 2$

a) $(-\infty,3)\cup[6,\infty)$

b) $(-\infty,3]\bigcap[6,\infty)$

c) $(-\infty,3]\cup(6,\infty)$

d) $(-\infty,3)$

6. Solve $-2x^2+5x<-12$

a) $(-\infty,\frac{3}{2})\cup[4,\infty)$

b) $(-\infty,\frac{-3}{2}]\bigcap(4,\infty)$

c) $(-\infty,\frac{-3}{2})\cup(4,\infty)$

d) $(-\infty,3)\cup(4,\infty)$

7. The domain of $f(x)=\frac{x-4}{x^2-x-12}$ is

a) $R-\{-3\}$

b) $R-\{4,-3\}$

c) $(-\infty,4)$

d) $R-\{4\}$

8. If $(x-3)$ is a factor of $f(x)=2x^2+ax-3$, the value of a is:

a) 5
b) 3
c) -5
d) -3

9. Solve $\cot x = \cos x, x \in [0, 2\pi]$

a) $\frac{\pi}{2}$, $\frac{3\pi}{2}$
b) $\frac{\pi}{2}$
c) $\frac{3\pi}{2}$
d) $\frac{\pi}{4}, \frac{3\pi}{4}$

10. Solve $\log(x-3)+\log(x-2)=\log(2x+24)$

a) $x=9$
b) $x=-2$
c) $x=-2, and\ x=9$
d) $x=-9$

11. Let $y=5\cos^2(5-3x^2)$, then $\frac{dy}{dx}=$

a) $-10\cos(5-3x^2)\sin(5-3x^2)$
b) $-60x\cos(5-3x^2)\sin(5-3x^2)$
c) $-60\cos(5-3x^2)\sin(5-3x^2)$
d) $-10\cos(5-3x^2)$

12. $\int(\tan^3 x\sec^2 x)\,dx\ is:$

a) $\frac{1}{4}\tan x + c$
b) $\frac{1}{4}\tan^4 x + c$
c) $\tan^4 x + c$
d) $\frac{1}{2}\tan^2 x + c$