RUTGERS
THE STATE UNIVERSITY OF NEW JERSEY

Sample Questions for the Rutgers – New Brunswick Math Placement Test
(This is not intended for Rutgers Camden or Rutgers Newark students)

Sample questions are listed below (answers appear after all questions below) – remember, the test is comprised of open-ended questions (not multiple choice). Not all topics will be presented.

1. $\frac{2}{9} + \frac{5}{6} \cdot \frac{1}{2} =$

2. *Solve for x*: $2(x - 4) = 4x + 5$

3. *Factor* $x^2 - 36$

4. *Solve for a*: $-\frac{1}{2}a - \frac{2}{3}\ \frac{3}{5}$

5. *Factor* $3x^2 - 14x + 8$

6. Theater tickets to the Livingston Theater production cost $18 for students and $25 for non-students. If 320 tickets were sold, and the total sales of all of the tickets was $6719, how many student tickets were sold?

7. *Express as a single fraction:* $1 + \frac{y-3x}{3x} + \frac{5x-2y}{4x}$

8. *Write in simplified form:* $\sqrt{\mathbf{32}} - \sqrt{\mathbf{2}}$

9. *Write in simplified form with positive exponents only:* $\frac{x^{-2}x^3}{x^4}$ *Assume x is a positive real number.*

10. *Solve the system:* $\begin{cases} y = -\frac{1}{2}x + 5 \\ 2x + y = 0 \end{cases}$

11. *Solve for x:* $|3 - 2x| > 4$

12. *Simplify: express your answer with positive exponents only:* $x^{-3/2}\, x^{3}\, x^{1/3}$ *Assume x is a positive real number.*

13. *Find the center and radius of the circle:* $x^2 + y^2 - 6x + 8y = 8$

14. *Sketch the graph of* $y = -2(x + 1)^2 - 2$

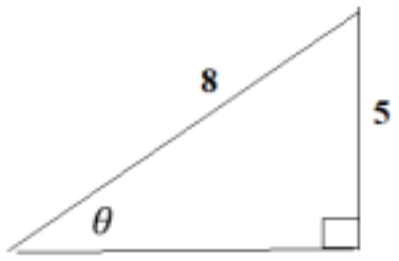
15. *Put in simplest radical form:* $\sqrt[3]{32x^7y^{18}}$

16. *If* $f(x) = 2x^2 - 3x + 5$ and $g(x) = \frac{2x}{5-x}$, then $f(g(3)) =$

17. *Solve for x:* $\log_x 64 = 3$

18. *Solve for x using base* 10: $9^{x-4} = 7^{-3x}$

19. *For the right triangle below, find* $\sec\theta$ exact *(not decimal approximations):*



20. Solve for x: $2\cos^2 x = 1 + \sin x$ for x in the interval $[0, 2\pi)$. *Express your answer in radians in terms of π.*

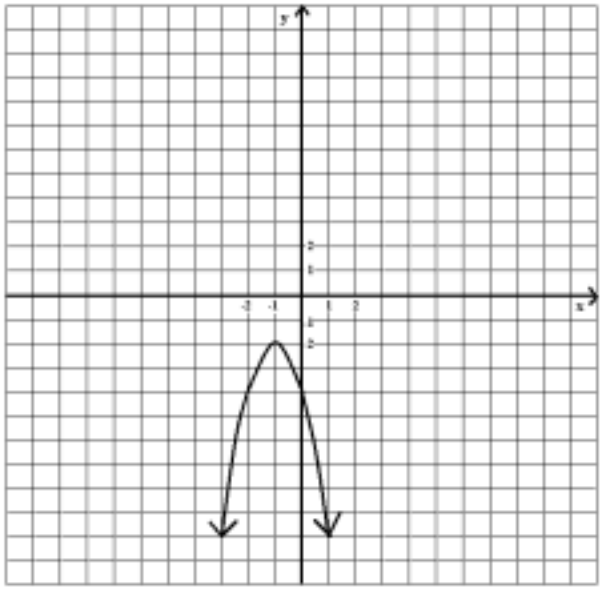
ANSWERS

1) $\frac{23}{36}$, **2)** $x = -\frac{13}{2}$, **3)** $(x-6)(x+6)$, **4)** $-\frac{38}{15}$, **5)** $(3x-2)(x-4)$, **6)** 183

7) $\frac{15x-2y}{12x}$, **8)** $3\sqrt{2}$, **9)** $\frac{1}{x^3}$, **10)** $x = -\frac{10}{3}$, $y = \frac{20}{3}$, **11)** $x < -\frac{1}{2}$ or $x > \frac{7}{2}$

12) $x^{11/6}$, **13)** Center = $(3,-4)$, radius = $\sqrt{33}$

14)



15) $2x^2y^6\sqrt[3]{4x}$, **16)** 14 , **17)** $x = 4$, **18)** $x = \frac{4 \log 9}{\log 9 + 3 \log 7}$

19) $\frac{8\sqrt{39}}{39}$, **20)** $x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$