UT Math Placement Assessment

Warmup Assessment

Full name: _____ EID: _____

Orientation: _____ Date: _____

Exam information and directions

- **DO NOT BEGIN YOUR EXAM UNTIL YOU ARE TOLD TO DO SO BY THE EXAM PROCTOR.**
- You will have seventy-five (75) minutes to complete this exam.
- There are 30 multiple questions on this exam.
- Calculators are NOT allowed on this exam.
- Use a #2 pencil with eraser for this exam. If you are feeling lucky, you may use either a pen with black or dark ink of any color except red.
- For multiple choice questions, **you must write your answer choice in the provided blank** to receive credit. On the real exam, you'll bubble the answer into the scantron.
- Good luck!

1. _____ How many solutions does

$$\frac{12}{x(x+8)} = 0$$

have? A. 0 B. 1 C. 2 D. more than 2

2. _____ Solve for a:

$$3(b-2a) - 6(4a+3b) = 7.$$

A. $a = -\frac{b}{2} - \frac{7}{30}$

B. $a = -\frac{5b}{6} - \frac{7}{18}$

C. $a = \frac{7b}{10} - \frac{7}{30}$

D. $a = -\frac{7b}{6} + \frac{7}{18}$

3. _____ For what value(s) of x is

$$(x-1)(x+2)(x-3)^2(x-4)^5$$

positive?

A. $-2 < x < 1$ and $x > 4$

B. $-2 < x < 1$ and $x > 3$

C. $x < -2$ and $1 < x < 3$

D. $x < -2$ and $1 < x < 4$

4. _____ Which of the expressions below is equivalent to

$$\frac{a^{-2}b^3}{c^8 d^{-4}}$$

assuming that a, b, c, and d are all positive?

A. $a^{-2}b^3c^{-8}d^{-4}$

B. $\frac{d^4}{a^{-2}b^{-3}c^{-8}}$

C. $\frac{a^{-2}c^{-8}d^4}{b^{-3}}$

D. $\frac{c^{-8}d^4}{a^{-2}b^{-3}}$

5. _____ The set of points

is represented by which of the following inequalities?

A. $|x-2| > 3$

B. $|x| > 3$

C. $|x-2| < 3$

D. $|x| < 5$

6. _____ Which of the following forms arises after rewriting

$$x^2 + 10x + 19$$

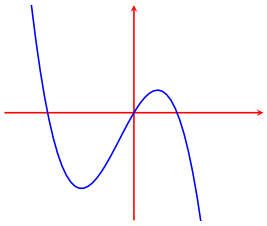
by completing the square? Assume $a > 0$.

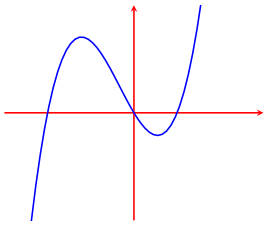
A. $(x + a)^2 + 19$
B. $(x + a)^2 - 6$
C. $(x - 5)^2 + a$
D. $(x + 10)^2 - a$

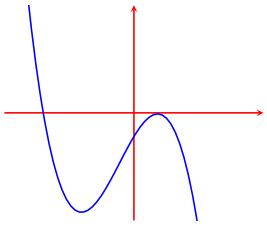
7. _____ Factor the expression $3x^2 - 10x - 8$ into a product of two linear terms with integer coefficients.

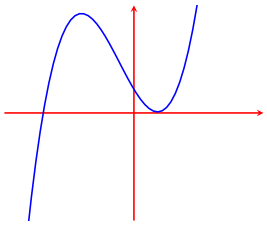
A. $(3x + 4)(x - 2)$
B. $(3x - 4)(x + 2)$
C. $(3x - 2)(x + 4)$
D. $(3x + 2)(x - 4)$

8. _____ Graph the function $y = 2x - x^2 - x^3$.

A.


B.


C.


D.


9. _____ At how many x-values does

$$y = (x + 5)^2(x + 11)(x - 7)^3$$

touch, but not cross, the x-axis?

A. more than two

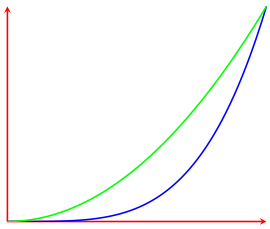
B. none

C. two

D. one

10. _____ Which of the following shows the graphs of $y = x^{1/2}$ (blue) and $y = x^{1/4}$ (green) on the interval $[0, 1]$?

A.



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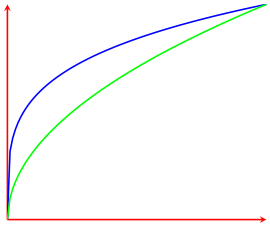
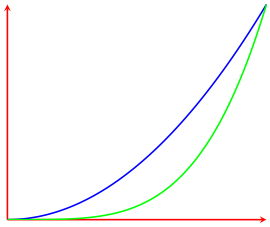
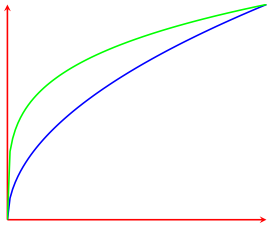


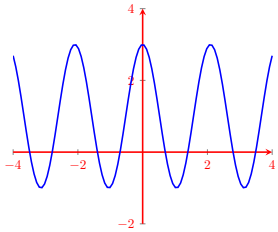
C.



D.

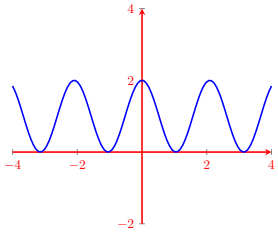


11. _____ Suppose that the graph of $y = f(x)$ is

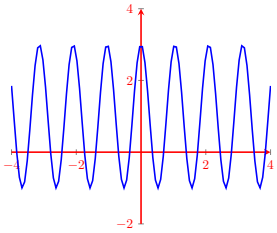


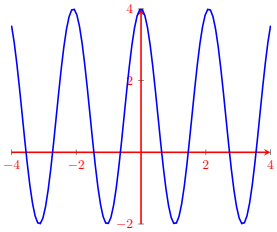
What is the graph of $y = f(2x)$?

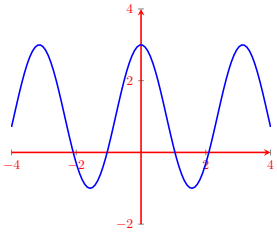
A.



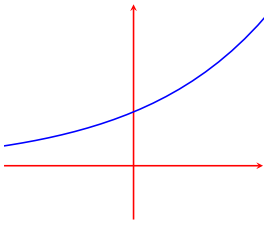
_____ pts earned/0 pts total

B. 

C. 

D. 

12. _____ Suppose that the graph of $y = f(x)$ is



This function has an inverse because its graph...

A. is above the x-axis.

B. passes the vertical line test.

C. passes the horizontal line test.

D. has no x-intercept.

13. _____ Suppose that $f(x) = x^2 + 1$ and $g(x) = 2x - 3$. What is $f(g(7))$?

A. 97

B. 122

C. 144

D. 94

14. _____ What is the domain of

$$f(x) = \frac{\sqrt{x+1}}{\sqrt{7-x}}?$$

A. $-1 \leq x < 7$

B. $-7 < x \leq 1$

C. $x < 7$

D. $x \geq -1$

15. _____ What is the range of

$$y = \frac{x}{1+x}?$$

A. $y \neq 1$
B. $0 < y < 1$
C. $y \neq 0$
D. $y > 1$

16. _____ What feature does the graph of

$$y = \frac{x(x+2)}{(x-1)(x+2)}$$

have at $x = 1$?

A. vertical asymptote
B. horizontal asymptote
C. x-intercept
D. hole

17. _____ What feature does the graph of

$$y = \frac{x(x+2)}{(x-1)(x+2)}$$

have at $x = -2$?

A. hole
B. vertical asymptote
C. x-intercept
D. horizontal asymptote

18. _____ How many x-intercepts does

$$y = \frac{(x-5)(x+7)(x-6)}{(x+2)(x-6)(x+3)}$$

have?

A. three
B. two
C. none
D. one

19. _____ How many solutions does

$$x^{3/2} = x^{5/2}$$

have?

A. three
B. none
C. one
D. two

20. _____ Find all solutions of the equation

$$x - \sqrt{x} = 12.$$

A. 9
B. ± 9 and ± 16
C. 16
D. 9 and 16

21. _____ Evaluate $\tan(\pi/3)$.
A. $\sqrt{3}$
B. 1
C. $1/2$
D. $\sqrt{3}/2$

22. _____ Evaluate $\arcsin(1/2)$.
A. $\pi/6$
B. $\pi/3$
C. $-\pi/3$
D. $-\pi/6$

23. _____ Find all solutions of

$$\sin(x) = \cos(x)$$

in the interval $[-\pi, \pi]$.
A. $\pi/4$
B. $\pm\pi/4$
C. none
D. $\pi/4, -3\pi/4$

24. _____ Find all solutions of

$$\sin(x) = \sec(x).$$

A. $n\pi + \pi/2$ for all integers n
B. $n\pi$ for all integers n
C. $n\pi + \pi/4$ for all integers n
D. none

25. _____ Which of the following is equivalent to

$$2\cos^2(x) - \cos(2x)?$$

A. 1
B. 2
C. $\sin^2(x)$
D. $\sin(2x)$

26. _____ The graph of

$$y = 3e^{4x}$$

crosses the y-axis at which of the following values?

A. $1/4$
B. $1/3$
C. 4
D. 3

27. _____ The expression

$$(3^a)^7$$

is equivalent to which of the following?

A. 3^{a+7}
B. 3^{7a}
C. $3^{(a^7)}$
D. none of the other choices

28. _____ How many solutions does

$$2^x = 3^x$$

have?

A. one
B. more than two
C. two
D. none

29. _____ The expression

$$\ln\left(ab^7\right)$$

is equivalent to which of the following? (Assume $a, b > 0$.)

A. $\ln(a) + 7\ln(b)$
B. $7\ln(a)\ln(b)$
C. $\ln(a) + \ln(7) + \ln(b)$
D. none of the other choices

30. _____ Solve

$$\log_5(x^2 - 3) = 0.$$

A. $\pm\sqrt{8}$
B. $\pm\sqrt{3}$
C. ± 2
D. none of the other choices