

Name _____

Please print your name as it appears on the class roster.

Please complete the problems that are easy for you to do. Please write (explain) how you arrive at your answers. Please identify the problems that are challenging for you (circle or write a list). Your responses will assist you in determining what you need to review. They will assist me in determining what review concepts to highlight and include in class.

Perform the indicated operations and simplify.

1) $(4x + y - z)^2$

A) $8x^2 + y^2 + z^2$

B) $16x^2 + y^2 + z^2 + 8xy - 8xz - 2yz$

C) $16x^2 + y^2 + z^2 - 4xyz$

D) $16x^2 + y^2 + z^2 + 2xy - 2xz - 2yz$

2) $(3m + 2)^2$

A) $3m^2 + 4$

B) $3m^2 + 12m + 4$

C) $9m^2 + 12m + 4$

D) $9m^2 + 4$

3) $(\sqrt{10} + \sqrt{6})(\sqrt{10} - \sqrt{6})$

A) 4

B) $10 - 2\sqrt{10}$

C) $10 - 2\sqrt{6}$

D) 16

4) $(\sqrt{11} + \sqrt{2})^2$

A) $13 - 2\sqrt{22}$

B) $9 + 2\sqrt{22}$

C) $22 + 2\sqrt{22}$

D) $13 + 2\sqrt{22}$

5) $\frac{a^2 + 8a + 15}{a + 5}$

A) $\frac{1}{a + 3}$

B) $\frac{1}{a - 3}$

C) $a + 3$

D) $a - 3$

6) $\frac{33x - 11}{24x^3 - 8x^2}$

A) $\frac{8}{11x^2}$

B) $-\frac{11}{8x}$

C) $\frac{11}{8x}$

D) $\frac{11}{8x^2}$

$$7) \frac{x}{x^2 - 16} - \frac{3}{x^2 + 5x + 4}$$

$$A) \frac{x^2 - 2x + 12}{(x - 4)(x + 4)(x + 1)}$$

$$B) \frac{x^2 - 2}{(x - 4)(x + 4)(x + 1)}$$

$$C) \frac{x^2 - 2x + 12}{(x - 4)(x + 4)}$$

$$D) \frac{x^2 + 2x + 12}{(x - 4)(x + 4)(x + 1)}$$

$$8) \frac{24}{x^2 + 4x} + \frac{4}{x} + \frac{6}{x + 4}$$

$$A) \frac{6}{x}$$

$$B) \frac{10}{x}$$

$$C) \frac{24}{x}$$

$$D) \frac{4}{x}$$

Write the converse and contrapositive of the statement.

9) If it rains today, then it will snow tomorrow.

A) Converse: If it does not snow tomorrow, then it will not rain today.

Contrapositive: If it snows tomorrow, then it will rain today.

B) Converse: If it snows tomorrow, then it will not rain today.

Contrapositive: If it does not snow tomorrow, then it will rain today.

C) Converse: If it snows tomorrow, then it will rain today.

Contrapositive: If it does not snow tomorrow, then it will not rain today.

D) Converse: If it snows tomorrow, then it will rain today.

Contrapositive: If it does not rain today, then it will not snow tomorrow.

10) If $a > b$ then $a^2 > b^2$.

A) Converse: If $a^2 > b^2$ then $a > b$.

Contrapositive: If $a \neq b$ then $a^2 \geq b^2$.

B) Converse: If $a^2 \neq b^2$ then $a \neq b$.

Contrapositive: If $a^2 > b^2$ then $a > b$.

C) Converse: If $a^2 \neq b^2$ then $a > b$.

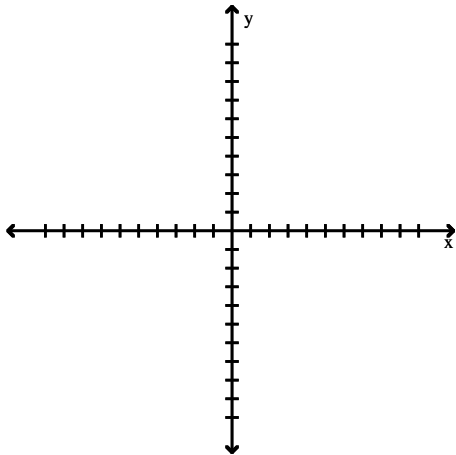
Contrapositive: If $a^2 > b^2$ then $a \neq b$.

D) Converse: If $a^2 > b^2$ then $a > b$.

Contrapositive: If $a^2 \neq b^2$ then $a \neq b$.

Graph the two equations and find the points at which the graphs intersect.

11) $x + y = 6$, $(x - 6)^2 + y^2 = 8$



Evaluate the function.

12) For $f(x) = x^2 + 3x + 1$, find $f(4)$.

A) 29

B) 5

C) 3

D) 27

13) For $f(x) = \frac{5x - 5}{8x^2 + 5x - 8}$, find $f(-4)$.

A) $-\frac{25}{156}$

B) $-\frac{3}{20}$

C) $\frac{3}{20}$

D) $-\frac{1}{4}$

14) For $f(x) = 4x^2 + 2x - 5$, find $f(k - 1)$.

A) $f(k - 1) = 4k^2 - 18k + 1$

B) $f(k - 1) = 4k^2 - 6k - 3$

C) $f(k - 1) = 4k^2 - 6k + 1$

D) $f(k - 1) = -6k^2 + 4k - 3$

15) For $f(x) = 3x^2 + 4x + 3$, find $f(k - 1)$.

A) $f(k - 1) = -2k^2 + 3k + 2$

B) $f(k - 1) = 3k^2 + 13k + 10$

C) $f(k - 1) = 3k^2 - 2k + 10$

D) $f(k - 1) = 3k^2 - 2k + 2$

16) For $f(x) = \sqrt{6 - x}$, find $f(m + 2)$.

A) $\sqrt{m + 2}$

B) $\sqrt{8 - m}$

C) $\sqrt{m + 2 - x}$

D) $\sqrt{4 - m}$

For the given function, find and simplify $[f(x + h) - f(x)]/h$.

17) $f(x) = 9x^2$

A) $9(2x+h)$

B) $\frac{9(2x^2 + 2xh + h^2)}{h}$

C) 9

D) $\frac{18}{h} + x + 9h$

Find the natural domain of the function.

18) $f(x) = \frac{1}{x + 9}$

A) $\{x: x \neq 9\}$

B) $\{x: x > 9\}$

C) $\{x: x \neq -9\}$

D) all real numbers

19) $y = \sqrt{15 - x}$

A) $\{x: x \geq 15\}$

B) $\{x: x \leq 15\}$

C) $\{x: x < 15\}$

D) all real numbers

20) $f(x) = \frac{x - 2}{\sqrt{x + 2}}$

A) $\{x: x > -2\}$

B) $\{x: \neq -2\}$

C) $\{x: x > 2\}$

D) $\{x: x \geq -2\}$

21) $f(x) = \sqrt{4 - x^2}$

A) $\{x: |x| \leq 2\}$

B) all real numbers

C) $\{x: x \geq 0\}$

D) $\{x: |x| < 2\}$

For the given functions f and g , find the requested function or functional value.

22) $f(x) = 5x^2 + 5$; $g(x) = x + 7$

Find $(f - g)(2)$.

A) -27

B) 20

C) 30

D) 16

For the given functions, find the requested function or functional value.

23) For $f(x) = 4x + 5$ and $g(x) = 4x - 1$, find $(f \circ g)(x)$.

A) $16x + 19$

B) $16x + 1$

C) $16x + 4$

D) $16x + 9$

24) For $f(x) = \frac{8}{x-4}$ and $g(x) = \frac{7}{5x}$, find $(f \circ g)(x)$.

A) $\frac{7x-28}{40x}$

B) $\frac{40x}{7-20x}$

C) $\frac{8x}{7-20x}$

D) $\frac{40x}{7+20x}$

25) For $f(x) = \frac{1}{x}$ and $g(x) = 6x^4$, find $(g \circ f)(x)$.

A) $\frac{6}{x^4}$

B) $\frac{6}{x}$

C) $\frac{1}{x^4}$

D) $\frac{1}{6x^4}$

Find functions f and g so that $h(x) = (f \circ g)(x)$.

26) $h(x) = \frac{1}{x^2 - 8}$

A) $f(x) = 1/x^2$, $g(x) = x - 8$

B) $f(x) = 1/x$, $g(x) = x^2 - 8$

C) $f(x) = 1/8$, $g(x) = x^2 - 8$

D) $f(x) = 1/x^2$, $g(x) = -1/8$

27) $h(x) = \frac{3}{x^2} + 9$

A) $f(x) = 1/x$, $g(x) = 3/x + 9$

B) $f(x) = x + 9$, $g(x) = 3/x^2$

C) $f(x) = x$, $g(x) = 3/x + 9$

D) $f(x) = 3/x^2$, $g(x) = 9$

28) $h(x) = (7x + 10)^4$

A) $f(x) = 7x^4$, $g(x) = x + 10$

B) $f(x) = x^4$, $g(x) = 7x + 10$

C) $f(x) = (7x)^4$, $g(x) = 10$

D) $f(x) = 7x + 10$, $g(x) = x^4$

Find the inverse of the function.

29) $f(x) = 4x^3 - 7$

A) $f^{-1}(x) = \sqrt[3]{\frac{x+7}{4}}$

B) $f^{-1}(x) = \sqrt[3]{\frac{x}{4}} + 7$

C) $f^{-1}(x) = \frac{\sqrt[3]{x+7}}{4}$

D) $f^{-1}(x) = \sqrt[3]{\frac{x-7}{4}}$

30) $f(x) = (x - 3)^2, x \geq 3$

A) $f^{-1}(x) = \sqrt{x - 3}$

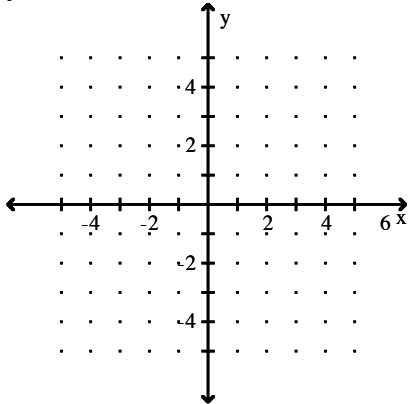
C) $f^{-1}(x) = \sqrt{x + 3}$

B) $f^{-1}(x) = -\sqrt{x} + 3$

D) $f^{-1}(x) = \sqrt{x} + 3$

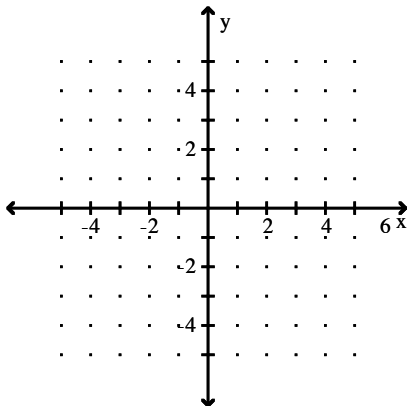
Graph the exponential function.

31) $y = 5^x$



Graph the function.

32) $y = \log_2 x$



Find the inverse for the given function f.

33) $f(x) = \frac{1}{5 + 3^x}$

A) $f^{-1}(x) = \log_3(x - 5)$

C) $f^{-1}(x) = \log_3\left(\frac{1}{x} - 5\right)$

B) $f^{-1}(x) = \log_5\left(\frac{1}{x} - 3\right)$

D) $f^{-1}(x) = \log_3\left(\frac{1}{x} + 5\right)$

34) $f(x) = 5 + 4^x$

A) $f^{-1}(x) = \log_5 \left(\frac{1}{x} - 4 \right)$

B) $f^{-1}(x) = \log_4(x - 5)$

C) $f^{-1}(x) = \log_4 \left(\frac{1}{x} - 5 \right)$

D) $f^{-1}(x) = \log_5(x - 4)$

Solve for x.

35) $\log_5 \left(\frac{1}{x} \right) = 4$

A) 20

B) $\frac{1}{625}$

C) $\frac{1}{20}$

D) 625

36) $\log_5 7 + \log_5 x = 1$

A) $\frac{5}{7}$

B) $\frac{1}{7}$

C) $\frac{7}{5}$

D) $\sqrt[7]{5}$

Express the angle in radian measure in terms of π .

37) -36°

A) $-\frac{\pi}{7}$

B) $-\frac{\pi}{4}$

C) $-\frac{\pi}{6}$

D) $-\frac{\pi}{5}$

Convert the radian measure to degrees. Round to the nearest hundredth if necessary.

38) $\frac{5\pi}{2}$

A) 540°

B) 495°

C) 450°

D) 360°

Find the exact value of the trigonometric function. Do not use a calculator or tables.

39) $\sin \left(\frac{7\pi}{4} \right)$

A) $-\frac{\sqrt{2}}{2}$

B) $\frac{\sqrt{3}}{2}$

C) $\frac{\sqrt{2}}{2}$

D) $-\frac{\sqrt{3}}{2}$

40) $\cos\left(\frac{2\pi}{3}\right)$

A) $\frac{\sqrt{2}}{2}$

B) $\frac{1}{2}$

C) $-\frac{\sqrt{3}}{2}$

D) $-\frac{1}{2}$

41) $\csc(\pi)$

A) -1

B) 0

C) 1

D) Undefined

Which answer choice is equivalent to the given expression?

42) $\cos x \tan x \csc x$

A) 2

B) $\cot x$

C) $\sin x$

D) 1

43) $\cos^2 x - \sin^2 x$

A) $3 \tan^2 x$

B) $2 \cos^2 x - 1$

C) $\csc^2 x$

D) 1

44) $\frac{1 + \tan^2 x}{\tan^2 x}$

A) $\csc^2 x$

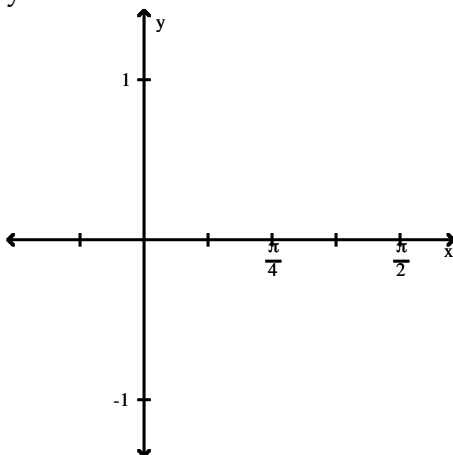
B) $\sec^2 x$

C) $\sin^2 x$

D) $\cos^2 x$

Sketch the graph on the coordinate system provided.

45) $y = \sin 4x$



Solve for x.

46) $\log_9 x + \log_9 (x - 80) = 2$

A) 1, -81

B) 9

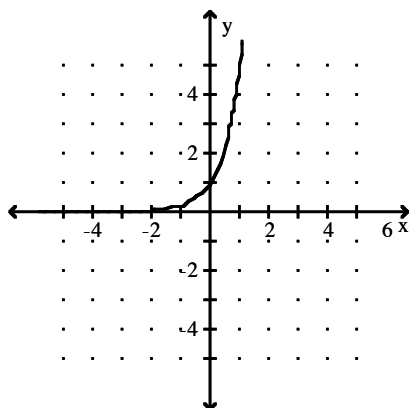
C) -1, 81

D) 81

Answer Key

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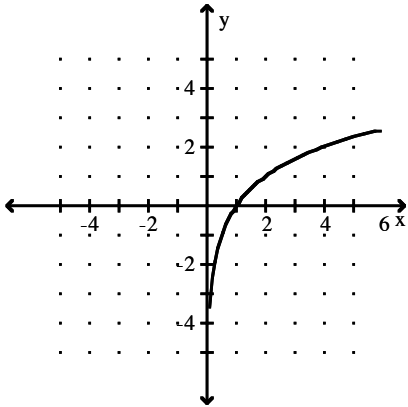
- 1) B
- 2) C
- 3) A
- 4) D
- 5) C
- 6) D
- 7) A
- 8) B
- 9) C
- 10) D
- 11) $(8, -2), (4, 2)$
- 12) A
- 13) D
- 14) B
- 15) D
- 16) D
- 17) A
- 18) C
- 19) B
- 20) A
- 21) A
- 22) D
- 23) B
- 24) B
- 25) A
- 26) B
- 27) B
- 28) B
- 29) A
- 30) D
- 31)



Answer Key

Testname: 16FALL_MATH3A_DIAGNOSTIC

32)



33) C

34) B

35) B

36) A

37) D

38) C

39) A

40) D

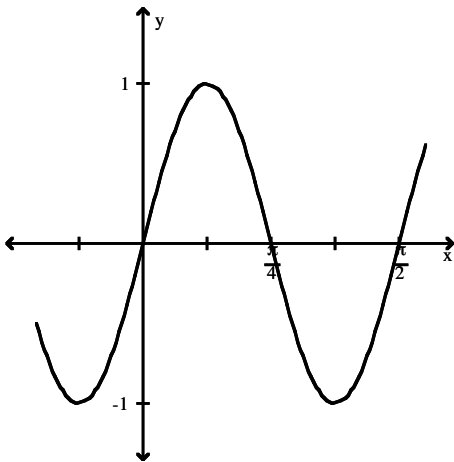
41) D

42) D

43) B

44) A

45)



46) D