

You may use a calculator. Please show all work directly on this test. To give yourself an accurate amount of time proportional to what you will receive on the day of the exam, give yourself 65 minutes to take the practice exam. **GOOD LUCK!**

1. Describe the transformations of the function  $f(x) = 2^x$  to  $f(x) = -2^{x+1} - 4$

**Do Your Figuring Here**

- A. Reflect over x-axis, Left 1, Down 4
- B. Reflect over x-axis, Right 1, Down 4
- C. Reflect over x-axis, Left 1, Up 4
- D. Reflect over x-axis, Right 1, Up 4

2. Use the Change of Base Theorem to find the value of:  
 $\log_5 10$

- A. 2
- B. 1.156
- C. 0.699
- D. 1.431

3. Identify the expression that is not equivalent to  $\log_6 100$

- A.  $\log_6 200 - \log_6 2$
- B.  $2\log_6 10$
- C.  $\log_6 50 + \log_6 2$
- D.  $\log_6 6^{100}$

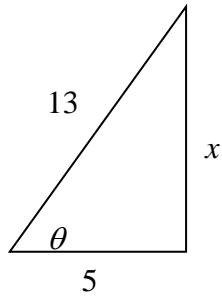
4. Find the solution to the equation:  
 $\ln(x + 2) = 4$

- A. 8.873
- B. 38
- C. 52.598
- D. 9998

5. Find the solution to the equation:  $3^{2x+1} = 9^2$
- A.  $x = \frac{1}{2}$
  - B.  $x = \frac{3}{2}$
  - C.  $x = \frac{3}{4}$
  - D.  $x = 0$
6. Find the solution to the equation:  $2e^{3x} + 1 = 23$
- A. 1.486
  - B. 0.224
  - C. 0.799
  - D. 2.398
7. You deposit \$200 in an account that pays 3% annual interest compounded monthly. What is the balance after 4 years?
- A. \$202.01
  - B. \$225.47
  - C. \$286.28
  - D. \$826.45
8. You buy a baseball card for \$100. It appreciates in value 5% per year. In how many years will it be triple its value?
- A. 116.9 years
  - B. 2.2 years
  - C. 2.9 years
  - D. 22.5 years

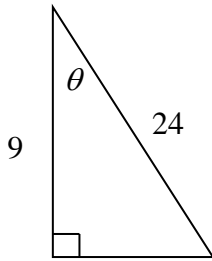
**Do Your Figuring Below**

9. Using the right triangle, find the value of  $\csc \theta$ .

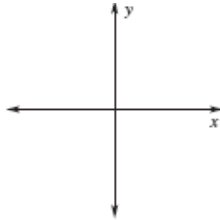


- A.  $\frac{5}{13}$   
B.  $\frac{13}{5}$   
C.  $\frac{12}{13}$   
D.  $\frac{13}{12}$
10. An airplane making its descent towards the ground makes an angle of descent of  $5^\circ$  with the ground. If the airplane is 1000 feet from the airport, how high is it above the ground?
- A. 108 feet  
B. 11,430 feet  
C. 11,473.7 feet  
D. 1,003.8 feet

11. Solve the following triangle for  $\theta$



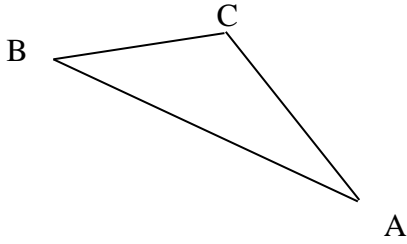
- A.  $22^\circ$   
 B.  $21^\circ$   
 C.  $68^\circ$   
 D.  $69^\circ$
12. Suppose  $\theta$  is an angle in standard position whose terminal side is in Quadrant II. Find the value of  $\tan \theta$  given  $\sin \theta = \frac{5}{13}$ .



- A.  $-\frac{5}{12}$   
 B.  $\frac{5}{12}$   
 C.  $\frac{12}{5}$   
 D.  $-\frac{12}{5}$
13. Find the exact value of  $\sec \frac{7\pi}{4}$ .
- A.  $\frac{\sqrt{2}}{2}$   
 B.  $-\frac{\sqrt{2}}{2}$   
 C.  $-\sqrt{2}$   
 D.  $\sqrt{2}$

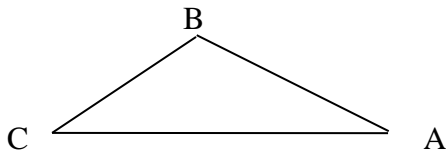
**Do Your Figuring Below**

14. Given the following triangle where  $\angle C = 98^\circ$ ,  $\angle A = 16^\circ$ , and  $c = 32$ , find the length of side  $a$  to the nearest tenth.



- A.** 0.495    **B.** 8.9    **C.** 29.7    **D.** 0.197

15. Given the following triangle where  $a = 17$ ,  $b = 23$ , and  $c = 12$ , find the measure of the largest angle.



- A.**         $21.2^\circ$   
**B.**         $103.6^\circ$   
**C.**         $76.4^\circ$   
**D.**         $113.8^\circ$

**CONTINUE TO NEXT PAGE**

**Do Your Figuring Below**

16. Identify the amplitude and period of the given trigonometric

equation:  $y = -3\sin\frac{2}{3}\theta$

- A. amplitude: 3      Period:  $3\pi$
- B. amplitude: 3      Period:  $2\pi/3$
- C. amplitude: - 3      Period:  $3\pi$
- D. amplitude: - 3      Period:  $2\pi3$

17. Identify the vertical and horizontal asymptotes of the

following rational equation:  $y = \frac{x^2 + x - 6}{4x^2 - 9}$

- A. Vertical:  $x = \pm\frac{3}{2}$       Horizontal:  $y = 4$
- B. Vertical:  $x = \pm\frac{3}{2}$       Horizontal:  $y = \frac{1}{4}$
- C. Vertical:  $x = -3, 2$       Horizontal:  $y = 4$
- D. Vertical:  $x = -3, 2$       Horizontal:  $y = \frac{1}{4}$

18. Simplify:  $\frac{5x-10}{5x} \div \frac{x^2+2x-8}{2x^2+6x-8}$

- A.  $\frac{2(x-1)}{x}$
- B.  $2x-2$
- C.  $\frac{2(x-2)^2}{x(x+1)}$
- D.  $x-1$

**Do Your Figuring Below**

19. Simplify:  $\frac{2}{x+3} + \frac{5}{x}$

A.  $\frac{10}{x+3}$

B.  $\frac{17}{x+3}$

C.  $\frac{7x+5}{x(x+3)}$

D.  $\frac{7x+15}{x(x+3)}$

20. Simplify:  $\frac{8x}{x^2-4} - \frac{4}{x+2}$

A.  $\frac{4}{x-2}$

B.  $\frac{2}{x}$

C.  $\frac{4}{x+2}$

D.  $\frac{4x-8}{x^2-4}$

21. Solve:  $\frac{1}{2x+5} = \frac{x}{11x+8}$

A.  $x = 4, -1$

B.  $x = 1$

C.  $x = \frac{-1}{3}$

D.  $x = 1, -4$

**CONTINUE TO NEXT PAGE**

22. Solve:  $\frac{7}{x-1} - 5 = \frac{6}{x^2-1}$

A.  $x = \frac{3}{5}, -2$

B.  $x = \frac{2}{5}, -2$

C.  $x = -\frac{2}{5}, 2$

D.  $x = -\frac{3}{5}, 2$

23. Orange Leaf Frozen Yogurt offers fourteen ice cream flavors, nine toppings, and three sauces. How many different ice creams can you make provided you choose one of each?

A. 26

B. 168

C. 378

D. 2002

24. How many ways can you select a committee of nine students from a group of seventeen?

A. 8,821,612,800

B. 153

C. 24,310

D. 3,719,430



**Do Your Figuring Below**

25. There are 20 students in a local math competition. In how many different ways can first, second, and third place be awarded?

- A. 1,140
- B. 6,840
- C. 60
- D. 23

26. How many five-card hands are possible that contain at least three kings?

- A. 4,560
- B. 4,512
- C. 55,296
- D. 5

27. Given a standard die, find the probability of rolling an even and then a three.

- A.  $\frac{1}{12}$
- B.  $\frac{2}{3}$
- C.  $\frac{1}{4}$
- D.  $\frac{1}{3}$

**Do Your Figuring Below**

28. In a bag of marbles, there are 13 blue, 6 red, and 5 green. Find the probability of drawing a blue, then a blue, then a red if replacement does not occur.

A.  $\frac{1}{12144}$

B.  $\frac{169}{2304}$

C.  $\frac{39}{506}$

D.  $\frac{1}{936}$

29. The odds in favor of an event are 2:5. Find the probability of the same event.

A.  $\frac{2}{5}$

B.  $\frac{2}{7}$

C.  $\frac{5}{2}$

D.  $\frac{5}{7}$

Directions: Work out each question slowly and carefully. You MAY write on the test. Show all of your work for full credit! GOOD LUCK!

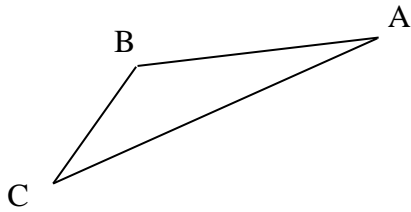
**For #1, evaluate all six trig functions.**

Evaluate all six trig functions of  $\theta$  given  $\theta = \frac{3\pi}{2}$ .

$\sin \theta =$  \_\_\_\_\_       $\cos \theta =$  \_\_\_\_\_       $\tan \theta =$  \_\_\_\_\_  
 $\csc \theta =$  \_\_\_\_\_       $\sec \theta =$  \_\_\_\_\_       $\cot \theta =$  \_\_\_\_\_

**For #2, Find the measure of angle B.**

In  $\triangle ABC$ ,  $\angle A = 23^\circ$ ,  $a = 10$ , and  $c = 8$ . Find  $\angle B$ .

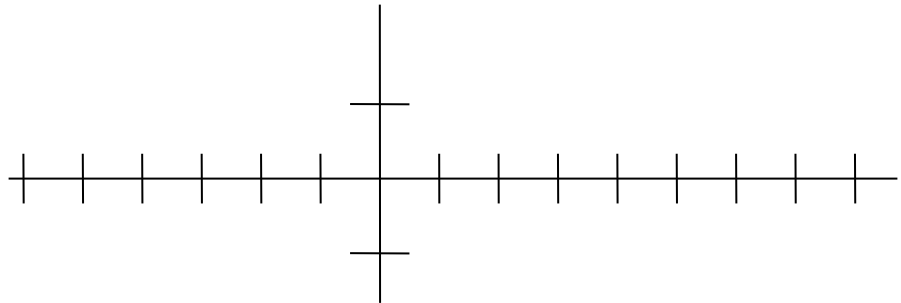


Answer = \_\_\_\_\_

**For #3, Graph the following trigonometric equation.**

Graph:  $y = -2 \sin 2\left(x + \frac{\pi}{4}\right) - 1$

amp: \_\_\_\_\_  
 Period: \_\_\_\_\_  
 Phase Shift: \_\_\_\_\_  
 Vertical Shift: \_\_\_\_\_



**For #4, given: A Standard Deck of Cards.**

You are dealt a five card hand. What is the probability of receiving a hand that contains two tens and two jacks?

K ♠	K ♥	K ♦	K ♣
Q ♠	Q ♥	Q ♦	Q ♣
J ♠	J ♥	J ♦	J ♣
10 ♠	10 ♥	10 ♦	10 ♣
9 ♠	9 ♥	9 ♦	9 ♣
8 ♠	8 ♥	8 ♦	8 ♣
7 ♠	7 ♥	7 ♦	7 ♣
6 ♠	6 ♥	6 ♦	6 ♣
5 ♠	5 ♥	5 ♦	5 ♣
4 ♠	4 ♥	4 ♦	4 ♣
3 ♠	3 ♥	3 ♦	3 ♣
2 ♠	2 ♥	2 ♦	2 ♣
A ♠	A ♥	A ♦	A ♣

Answer: \_\_\_\_\_

**For #5, Find the x-intercepts and the y-intercepts of the following function**

$$y = \frac{2}{x-1} - 5$$

**x-intercept:** \_\_\_\_\_

**y-intercept:** \_\_\_\_\_

**For #6, Solve.**

$$\frac{3}{x^2 + 5x + 6} + \frac{x-1}{x+2} = \frac{7}{x+3}$$

**Answer:** \_\_\_\_\_

**For #7, You invest \$850 in an account that pays 3.5% annual interest compounded continuously. How long will it take for you to have \$1100?**

**Answer =** \_\_\_\_\_

**For #8, fill in each of the missing pieces of information and graph the logarithmic function. You must graph the parent and the transformed graph. You may make a table if you would like, but it will not be graded.**

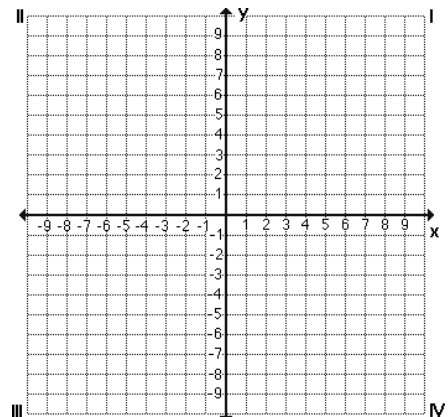
$$y = \log_2(x + 4)$$

**Transformations:** \_\_\_\_\_

**Parent Rewrite Exponentially:** \_\_\_\_\_

**Domain:** \_\_\_\_\_

**Range:** \_\_\_\_\_



**End Time:** \_\_\_\_\_

## Answers

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

1.  $\sin \theta = -1$        $\cos \theta = 0$        $\tan \theta = UNDEF$   
 $\csc \theta = -1$        $\sec \theta = UNDEF.$        $\cot \theta = 0$

2.  $139^\circ$       3. Amp = 2, Per =  $\pi$       4.  $\frac{33}{54145}$  or  $6.09 \times 10^{-4}$   
PS = left  $\pi/4$   
VS = down 1

5.  $(7/5, 0)$  and  $(0, -7)$       6.  $x = 7$       7.  $x = 7.4$  years

8. Transformations: Left 4; Parent:  $y = \log_2 x$  ( $2^y = x$ ); Domain:  $(-4, \infty)$ ; Range:  $(-\infty, \infty)$

