

Placement Exam for AP calculus BC**Bradshaw**

Name _____ Class _____ Date _____

*Please understand that this is not part of your “Summer Assignment”. It is merely a suggestion. You should try to complete this as if it were an exam. Mastery of all of the concepts tested here is necessary in order for you to be successful in BC calculus. Obviously, I cannot cover everything in 22 questions. A number of trigonometric identities and rules are not covered like the power reducing rule, half and double angle formulas, as well as topics like the properties of the natural logarithmic function, circles and conic sections, the difference quotient and others. This exam should be completed in less than one hour and no calculator should be used on this exam.

1. Find the polynomial with the given zeros.

$0, 3, -2$ and $(-1, 8)$

1. _____

2. Use synthetic division to factor completely.

$$x^3 - x^2 - 16x - 20 \div x + 2$$

2. _____

3. Find the polynomial that has the given zeros.

Zeros are: 2 , and $2 - i$

3. _____

4. Find the zeros.

$$f(x) = x^3 - x^2 - 17x + 65$$

4. _____

5. Find the domain, then, if possible, write in lowest terms; find x and y intercepts and all asymptotes, and graph each equation.

$$f(x) = \frac{x^2 + 3x}{x^3 - 4x}$$

Domain _____

Lowest terms _____

y -intercept _____

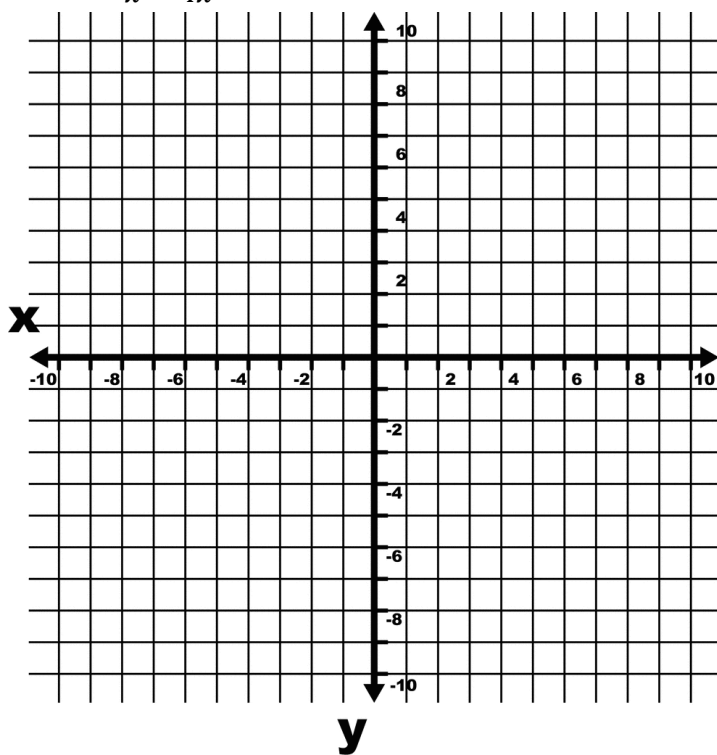
x -intercept _____

Vertical asymptote _____

Horizontal asymptote _____

Oblique asymptote _____

Hole(s) _____



Solve

$$6. \frac{3x-5}{x+2} \leq 2$$

6. _____

Solve

7. $64^{x^2}(16^{3x}) = 4^{-1}$ $x =$ _____
*exact answer in radical form

8. $(3)10^{3x-5} = 6$ $x =$ _____

Find the “exact value” (no rounded decimals).

9. $\log_5 50 - \log_5 2 =$ _____

Write as a sum or difference. Express powers as factors.

10. $\ln \frac{\sqrt[3]{x^2+1}}{x\sqrt{x-1}}$ _____

Write as a single logarithm.

11. $\log(x^2 + 7x + 10) - 3\log(x + 2)$ _____

Solve each equation. Use only exact answers (no rounded decimals).

12. $\log_6 x + \log_6 (x + 2) = 2$ _____

13. $3^{2x} + 3^{x+1} - 4 = 0$ _____

14. $s =$ arc length, $r =$ radius and $\theta =$ the central angle. Find the missing value.

$\theta = \frac{5}{4}$ radians, $s = 10\text{cm}$, $r =$ _____

15. A is the area of the sector of a circle with radius r and a central angle of θ .

Find the missing value.

$r = 4\text{m}$, $\theta = 150^\circ$ $A =$ _____

16. Find the “exact value”.

7) $\sin(-\frac{11\pi}{6})$ _____

17. Find the exact values of the trigonometric functions.

$$\sin \theta = -\frac{1}{4}, \tan \theta > 0 \quad \cos \quad \tan \quad \csc \quad \sec \quad \cot$$

18. Graph the following function. Label 5 points.

$$y = 2 \sec\left(\frac{2}{3}x\right) - 3 \quad \text{Amplitude } \quad \text{Period } = \quad \text{Five ordered pairs } (\quad , \quad)$$



(,)

(,)

(,)

(,)

Find the exact value. (Do not provide a decimal value), (if it is undefined write DNE)

19. $\csc [\tan^{-1}(-2)]$ _____

20. $\cot^{-1}\left(-\frac{\sqrt{3}}{3}\right)$ _____

21. $\sin \frac{\pi}{18} \cos \frac{5\pi}{18} + \cos \frac{\pi}{18} \sin \frac{5\pi}{18}$ _____

22. $\cos^2 \theta - \sin^2 \theta + \sin \theta = 0$ _____