

1. Indicate the x - and y - intercept on the graph of the function $y = x^3 - 64$.
- x -intercept 4, y -intercept 64
 - x -intercept 64, y -intercept -4
 - x -intercept 4, y -intercept -4
 - x -intercept 4, y -intercept -64
 - x -intercept 64, y -intercept 4
2. Find the quotient and remainder using long division for $\frac{4x^3 + 8x^2 + 13x}{2x^2 + 5}$.
- The quotient is $3x - 20$; the remainder is $2x + 4$.
 - The quotient is $2x - 4$; the remainder is $3x - 2$.
 - The quotient is $3x - 20$; the remainder is $2x - 4$.
 - The quotient is $2x + 4$; the remainder is $3x - 20$.
 - The quotient is $2x + 4$; the remainder is $2x + 5$.
3. Use the Factor Theorem and choose a factor of $P(x) = x^3 + 5x^2 + 7x + 3$.
- $x + 1$
 - $x + 3$
 - $x - 1$
 - $x - 3$
 - $x + \frac{1}{3}$
4. Find all rational zeros of the polynomial $P(x) = x^3 - 108x - 432$.
- $-6, -12$
 - $-6, 12$
 - $6, -6$
 - $6, 12$
 - $-12, 12$
5. Find all the real zeros of the polynomial $P(x) = x^3 + 8x^2 + 8x - 8$.
- $2, -2 \pm \sqrt{13}$
 - $-3, -3 \pm \sqrt{13}$
 - $-2, -3 \pm \sqrt{13}$
 - $-2, 2 \pm \sqrt{13}$
 - $-3, -2 \pm \sqrt{13}$
6. Factor the polynomial $P(x) = x^3 + x^2 + 4x + 4$ completely and find all its zeros.
- $2i, -2i, -1$
 - $2i, -2i, -1, 1$
 - $2, -2, 1$
 - $2i, -2i, 1, 0$
 - $2, -2, 0$
7. Find the polynomial $P(x)$ of degree 3 with integer coefficients, and zeros 5 and $5i$.
- $x^3 - 10x^2 + 25x$
 - $x^3 - 5x^2 + 25x - 31$
 - $x^3 - 5x^2 + 25x - 125$
 - $x^3 + 10x^2 - 5x + 125$
 - $3x^2 - 10x + 25$
8. Find the x - and y -intercepts of the rational function $f(x) = \frac{x - 12}{x + 4}$.
- x -intercept $(12, 0)$, y -intercept $(0, -5)$
 - x -intercept $(-3, 0)$, y -intercept $(0, 12)$
 - x -intercept $(-12, 0)$, y -intercept $(0, -2)$
 - x -intercept $(12, 0)$, y -intercept $(0, -3)$
 - x -intercept $(-1, 0)$, y -intercept $(0, 12)$
9. Find the horizontal and vertical asymptotes of the rational function $r(x) = \frac{9}{x + 9}$.
- horizontal asymptote $y = 9$; vertical asymptote $x = -9$
 - horizontal asymptote $y = 9$; vertical asymptote $x = 9$
 - horizontal asymptote $y = 0$; vertical asymptote $x = -9$
 - horizontal asymptote $y = 0$; vertical asymptote $x = -18$
 - horizontal asymptote $y = 0$; vertical asymptote $x = 9$
10. State the range of the function $h(x) = 4 + \left(\frac{1}{7}\right)^x$.
- $(-4, 4)$
 - $(-4, \infty)$
 - $(0, \infty)$
 - $(-\infty, \infty)$
 - $(4, \infty)$

11. Express the equation $e^{x-3} = 0.1$ in logarithmic form.

- a) $x = 3 + \ln 0.1$
- b) $x = 0.1 + \ln 3$
- c) $x = 0.1 + \ln 3$
- d) $x = 0.1 - \ln 3$
- e) $x = -3 + \ln 0.1$

12. Evaluate the expression $\log_5 \sqrt[3]{625}$.

- a) $\frac{4}{7}$
- b) $\frac{7}{4}$
- c) 4
- d) $\frac{1}{7}$
- e) 28

13. Rewrite the expression $\log 24 + \frac{1}{2} \log 5 - \log 8$ as a single logarithm.

- a) $\log \frac{1}{5} \sqrt{3}$
- b) $\log 5\sqrt{3}$
- c) $\log 3\sqrt{5}$
- d) $\log 15$
- e) $\log \frac{1}{3} \sqrt{5}$

14. Solve the logarithmic equation $\log_3(5 - x) = 1$ for x .

- a) $x = 3$
- b) $x = 2$
- c) $x = -3$
- d) $x = -8$
- e) $x = 8$

15. The number of bacteria in a culture is modeled by the function $n(t) = 300e^{0.6t}$ where t is measured in hours. What is the initial number of bacteria?

- a) 1 bacteria
- b) 600 bacteria
- c) 60 bacteria
- d) 300 bacteria
- e) 0 bacteria

16. The area of a circle is 60 cm^2 . Find the area of a sector of this circle that subtends a central angle of $\frac{\pi}{5}$ rad.

- a) $\pi \text{ cm}^2$
- b) $\frac{\pi}{5} \text{ cm}^2$
- c) 5 cm^2
- d) 10 cm^2
- e) 6 cm^2

17. Evaluate $\sin 30^\circ \sin 60^\circ + \cos 60^\circ \cos 30^\circ$.

- a) 0
- b) $\frac{\sqrt{3}}{2}$
- c) $\frac{1}{2}$
- d) 1
- e) $\frac{\sqrt{2}}{2}$

18. Find the value of the trigonometric function $\tan \theta$ if $\sin \theta = \frac{3}{5}$ and θ is in the second quadrant.

- a) $\frac{3}{4}$
- b) $\frac{4}{5}$
- c) $-\frac{3}{4}$
- d) $-\frac{4}{5}$
- e) 1

19. If $a = 20$, $b = 28$ and $\angle A = 30^\circ$ in a triangle ABC , find $\sin \angle B$.

- a) $\frac{7}{10}$
- b) $\frac{2}{3}$
- c) $\frac{14}{15}$
- d) $\frac{5}{7}$
- e) $\frac{2}{7}$

20. Find the area of the triangle ABC whose sides are $a = 13$, $b = 20$
and $c = 21$.

- a) 17
- b) 54
- c) 260
- d) 126
- e) 27

FALL 06 MATH 041 EXAM 2

ITEM NO.	FORM:
1	D
2	D
3	AB
4	B
5	C
6	A
7	C
8	D
9	C
10	E
11	A
12	A
13	C
14	B
15	D
16	E
17	B
18	C
19	A
20	D