

Math 1021 Review Test 3 Answer Key

1) $x = 3/2, 4$ 2) $x = 0, 2$ 3) $x = \pm \frac{3}{5}$ 4) $x = \pm 2\sqrt{3}$

5) $x = 5 \pm 2\sqrt{7}$ 6) $x = \frac{2 \pm \sqrt{2}}{2}$ 7) $x = 3 \pm 2\sqrt{3}$ 8) $x = \frac{3 \pm \sqrt{3}}{2}$

9) $x = 2 \pm i$ 10) $x = -1 \pm \frac{\sqrt{6}}{2}i$

11) $1 + 5i$ 12) $12 - 5i$ 13) $\frac{5}{13} + \frac{12}{13}i$

14) $x = \pm\sqrt{2}, \pm\sqrt{5}i$ 15) $y = 1, 16$ 16) $x = 16$

17) $x = \sqrt[3]{5}, 1$

- 18) a. Two different real-number solutions,
b. two different imaginary-number solutions.

- 19) a. x -intercepts: $(3, 0)$ and $(-1, 0)$; b. y -intercept $(0, -3)$;
c. The zeros of the function: $-1, 3$;
d. Domain $(-\infty, +\infty)$, Range $[-4, +\infty)$;
e. Vertex $(1, -4)$; f) Axis of Symmetry $x = 1$;
g. Minimum value of the function: -4 ;
h. Relative minima of the function -4 at $x = 1$;
i. Increasing $(1, +\infty)$, Decreasing $(-\infty, 1)$.

- 20) Leading term: $-t^3$, leading coefficient: -1 , degree: 3 and cubic.

- 21) $\frac{3}{2}$, multiplicity 1; -3 , multiplicity 2 ; 2 multiplicity 5.

- 22) Since $f(a)=474$ and $f(b)=1079$, $f(a)$ and $f(b)$ have same signs. Therefore, using the intermediate value theorem, it cannot be determined whether the function $f(x)$ has a real zero between $a=5$ and $b=6$.

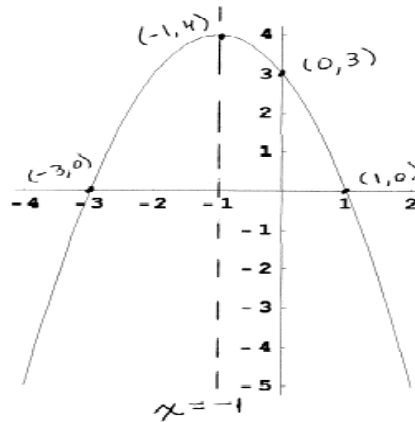
- 23) a. Has a maximum of 15 real zeros; b. has a maximum of 15 x -intercepts; c. has a maximum of $15-1=14$ turning points.

24) D

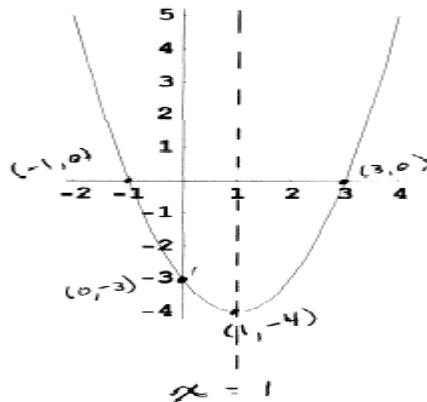
- 25) $3/2$ or 1.5 sec, 44ft.

- 26) 500 ft by 250 ft.

- 27) Vertex: $(-1,4)$; Axis of Symmetry: $x = -1$; x-intercepts: $(1,0)$ and $(-3,0)$; y-intercept: $(0,3)$



- 28) Vertex: $(1,-4)$; Axis of Symmetry: $x = 1$; x-intercepts: $(3,0)$ and $(-1,0)$; y-intercept: $(0,-3)$



29.

a. $c = 2\sqrt{41}$

b. $b = \sqrt{14}$

c. $a = \sqrt{1 - x^2}$

30. $8\sqrt{5}$ feet

31. $\sqrt{117}$ in

32. a. increasing on $(3, 5)$. b. decreasing on $(-\infty, -1)$ and $(5, \infty)$.
 c. constant on $(-1, 3)$.
 d. Local max: $y=2$ at $x=5$
 e. Domain $(-\infty, \infty)$, Range $(-\infty, \infty)$