

[1]  $y = 15,625$

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[2]  $y = 279,936$

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[3]  $y = 10$

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[4]  $y = 6$

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[5]  $0$

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[6]  $\pm 1$

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[7]  $0$

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[8]  $\sqrt{2}$

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[9]  $\sqrt{2}$

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[10]  $1$

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[11]  $-\frac{5}{13}$

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[12]  $-\frac{12}{5}$

---

[13]  $\frac{13}{12}$

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[14]  $-\sqrt{3}$

---

[15]  $2$

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[16]  $-\frac{2\sqrt{3}}{3}$

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[17] domain:  $(\pm\infty, \infty)$ , range:  $(0, \infty)$

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[18] domain:  $(\pm\infty, \infty)$ , range:  $(0, \infty)$

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[19] domain:  $(0, \infty)$ , range:  $(\pm\infty, \infty)$

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[20] domain:  $(1, \infty)$ , range:  $(0, \infty)$

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[21]  $(0, \infty)$

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[22]  $\left[\pi, \frac{3\pi}{2}\right)$  and  $\left(\frac{3\pi}{2}, 2\pi\right]$

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[23]  $(\pm\infty, 2)$

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[24]  $\left(\frac{\pi}{2}, \frac{3\pi}{2}\right)$

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[25]  $\lim_{x \rightarrow \infty} f(x) = \infty$  and  $\lim_{x \rightarrow \pm\infty} f(x) = 0$

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[26]  $\lim_{x \rightarrow \pm\infty} f(x) = \infty$

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[27]  $y = 0$

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[28]  $x = 0$

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[29]  $x = \frac{\pi}{2}$  and  $x = \frac{3\pi}{2}$

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[30]  $x = 0$  and  $x = \pi$

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[31]  $1.15F_n$

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[32]  $F_n = 5000e^{0.15n}$

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$\lim_{x \rightarrow \infty} F_n = 50,000$ ; Answers vary. Sample: The limited growth model takes into account that

[33] no more than 50,000 bass can survive in the lake.

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[34]  $1.14F_n$

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[35]  $F_n = 5000e^{0.14n}$

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$\lim_{x \rightarrow \infty} F_n = 61,000$ ; Answers vary. Sample: The limited growth model takes into account that

[36] the maximum urban population is estimated to be about 61 billion.

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[37]  $(0, \pm 0.5x^2 + 7)$  and  $(x, \pm 0.5x^2 + 7)$

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[38]  $A(x) = \pm 0.5x^3 + 7x$

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[39] about 7.86 square units

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[40]  $(0, \pm 0.4x^2 + 7)$  and  $(x, \pm 0.4x^2 + 7)$

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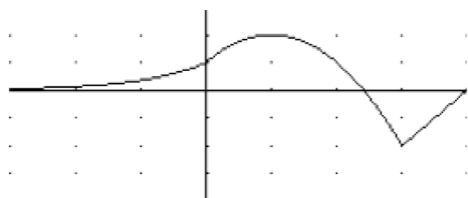
[41]  $A(x) = \pm 0.4x^3 + 7x$

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[42] about 5.56 square units

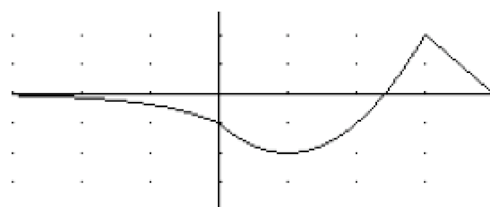
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Answers vary. Sample:



[43]

Answers vary. Sample:



[44]

[45]  $f(\pm 2) \approx 1$ ; this is a local maximum

The function has four local minima equal to approximately 0.8, 0, 1 and  $\pm 0.4$ ; the absolute minimum is  $\pm 0.4$ . There are two local maxima, approximately equal to 1 and 2; the absolute maximum is 2.

[47]  $(\pm 2.5, \pm 2)$  and  $(0.3, 1.5)$

[48]  $f(0) \approx 0.8$ ; this is a local minimum

The function has three local maxima, equal to approximately 1, 2 and 2.4; there is no absolute maximum. The function has three local minima, equal to approximately 0.8, 1, and 2; there is no absolute minimum.

[50]  $(\pm \infty, \pm 0.8)$ ,  $(0, 1.5)$ , and  $(3, \infty)$