

Honors Algebra 2 A
Semester Exam Review
2015-2016
Answers

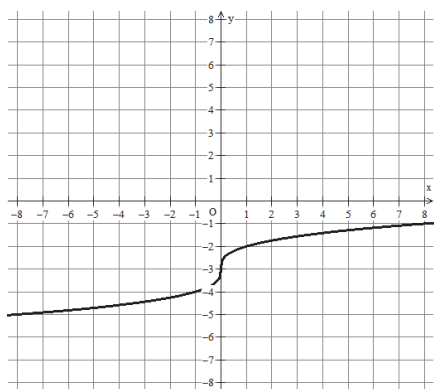
Unit 1, Topic 1

1.
 - a. (b, a)
 - b. 3
 - c. $y = x$
 - d. domain
 - e. range

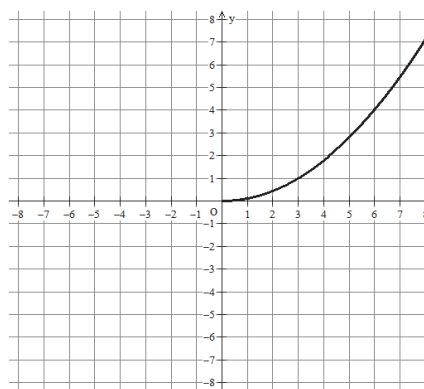
2.
 - a. Example: Let $x = 4$, then $f(4) = 16$, $g(16) = \frac{1}{256}$. The original number is not the result.
 - b. Example: Let $x = 2$, then $f(2) = 6$, $g(6) = -18$. The original number is not the result.

3.
 - a. $g(x) = \frac{x+2}{3}$
 - b. $g(x) = \sqrt[3]{\frac{x-9}{2}}$
 - c. $g(x) = \frac{x^3}{5}$
 - d. $g(x) = \log x$
 - e. $g(x) = e^x$

4. a.



b.



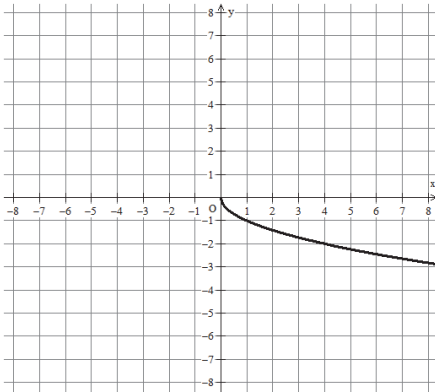
5. a. $g = \frac{p+18}{2}$
b. 25 glasses
6. a. $c = \frac{s-200}{2.5}$
b. 50 items
7. a. Several values of y are associated with more than one value of x .
b. Yes. Each y -value is associated with only one value of x .

Unit 1, Topic 2

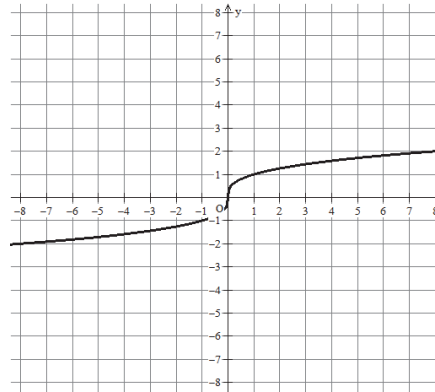
8. a. $\sqrt[5]{x}$
b. $\frac{1}{\sqrt[3]{y}}$
c. $\sqrt[3]{z^2}$ or $(\sqrt[3]{z})^2$
9. a. $-\frac{1}{2}$
b. $\frac{4}{5}$
c. 9
d. 3
e. $\frac{5}{6}$
10. a. $\frac{1}{9}$
b. 9
c. 10
11. a. $n = 32$
b. $n = 2$
12. Yes, $x = 25$ is extraneous. $3\sqrt{25} = 15 \neq -15$.
13. $x = -1$ is extraneous.

14. $x = -8$ is not extraneous. $\sqrt[3]{-8} = -2$.

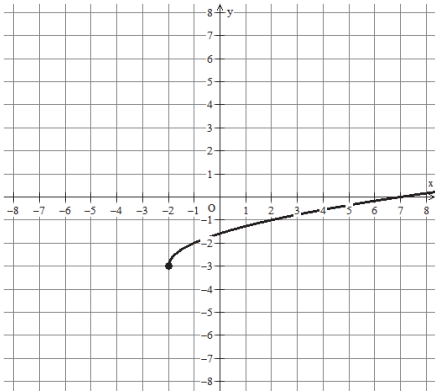
15. a.



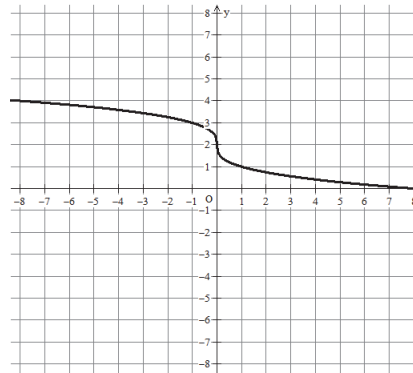
b.



c.



d.



16. a. $x \geq 0$

b. $f(x) \leq 7$

c. $[0, \infty)$

d. $(0, 7)$

17. $x = 200$

18. \$205

19. 1978

20. $g(x) = -\sqrt{x-3} + 1$

Unit 1, Topic 3

21. a. $f(x) = 3^{-x}$ or $f(x) = \left(\frac{1}{3}\right)^x$
- b. $g(x) = \log_5 x$
- c. $h(x) = 2^x$
- d. $m(x) = -\log x$
22. a. x is between 4 and 5
- b. x is between 2 and 3
- c. x is between 1 and 2
- d. x is between 0 and 1
23. a. $\log_4 16 = 2$
- b. $\log 1000 = 3$
- c. $\ln 1 = 0$
24. a. $10^{-2} = \frac{1}{100}$
- b. $e^{-1} = \frac{1}{e}$
- c. $9^2 = 81$
25. a. 2
- b. -2
- c. 4
- d. 1
- e. 0
- f. -1
- g. $\frac{3}{2}$
- h. $\frac{1}{2}$

26. a. exponential decay
b. exponential decay
c. exponential growth
27. a. $B(t) = 300e^{0.70t}$
b. $P(t) = 2000(1+0.11)^t = 2000(1.11)^t$
c. $F(t) = 500\left(1 + \frac{0.06}{12}\right)^{12t} = 500(1.005)^{12t}$
d. $D(t) = 700(1-0.08)^t = 700(0.92)^t$
e. $G(t) = 4e^{-0.12t}$
28. a. $t = \frac{\log(9800)+2}{3} \approx 1.997$
b. $t = \ln(55) - 4 \approx 0.007$
29. a. $\frac{250-100}{2} = 75$ people per hour
b. $y = 100(1.5)^x$
30. $y = 5(2)^x$
31. a. 25%
b. 50
c. $t \approx 2.77$ years
32. \$4,030.57

33. a. f, h
b. g, p
c. f, g
d. f, h
e. g, p
f. g, p
g. f, h
h. h, p
i. g, p
j. f, h
34. a. $g(x) = e^{x-1}$
b. $h(x) = e^x - 4$
c. $p(x) = -e^x$
d. $s(x) = e^{-x}$
e. $w(x) = 2e^x$
f. $t(x) = -e^x - 5$
g. $z(x) = e^{x-3}$
35. a. $g(x) = \log_2(x+2)$
b. $h(x) = \log_2(x-2)$
c. $p(x) = -\log_2 x$
d. $s(x) = \log_2(-x)$
e. $w(x) = \frac{1}{3} \log_2 x$
f. $t(x) = \log_2(x+3)$
g. $z(x) = -\log_2 x - 3$

36. a. greater; 1
b. horizontal; $y = 0$
c. all real numbers
d. $f(x) > 0$
e. greater than 1
f. between 0 and 1
g. $(0,1)$
37. a. greater; 1
b. vertical; $x = 0$
c. $x > 0$
d. all real numbers
e. greater than 1
f. between 0 and 1
g. $(1,0)$

Unit 2, Topic 1

38. a. $x = 2$; $x = -2$ is extraneous
b. The x -coordinate of the point of intersection.
c. The bottom half of the parabola should be drawn, passing through the point $(-2, -1)$.
39. 0
40. a. $9 - 4i$
b. $2 + 13i$
c. $30 + 19i$
d. 25
e. $24 + 70i$

41. a. $(a+bi)^2 = a^2 + (2ab)i + b^2i^2 = a^2 + (2ab)i - b^2$ The product will always have an imaginary part, so it cannot be real.
- b. $(bi)^4 = b^4i^4 = b^4$. Since b is real, b^4 is real. The product will never have an imaginary part, so it will always be real.
42. a. $x+4$
- b. $(-4, 0)$
- c. always
- d. -4
43. a. $x - (5 - 7i)$
- b. there are no x -intercepts
- c. never
- d. $5 + 7i$
- e. $5 - 7i; 5 + 7i$
44. a. sketch a parabola that intersects the x -axis in two distinct places.
- b. sketch a parabola that touches the x -axis in one place.
- c. sketch a parabola that does not intersect the x -axis.
45. a. $x = 3 + 7i; x = 3 - 7i$
- b. $x = -4 + i\sqrt{11}; x = -4 - i\sqrt{11}$
- c. $x = \frac{-8 \pm i\sqrt{56}}{2}$ or $x = -4 \pm i\sqrt{14}$
- d. $x = \frac{6 \pm i\sqrt{84}}{6}$ or $x = 1 \pm \frac{i\sqrt{21}}{3}$
- e. $x = \frac{-5 \pm i\sqrt{11}}{6}$

Unit 2, Topic 2

46. Answers will vary.
- a. End behavior of your graph should be as $x \rightarrow -\infty, y \rightarrow \infty$ and as $x \rightarrow \infty, y \rightarrow \infty$
 - b. End behavior of your graph should be as $x \rightarrow -\infty, y \rightarrow \infty$ and as $x \rightarrow \infty, y \rightarrow -\infty$
 - c. End behavior of your graph should be as $x \rightarrow -\infty, y \rightarrow -\infty$ and as $x \rightarrow \infty, y \rightarrow -\infty$
 - d. End behavior of your graph should be as $x \rightarrow -\infty, y \rightarrow -\infty$ and as $x \rightarrow \infty, y \rightarrow \infty$
- 47.
- a. yes
 - b. no
 - c. no
- 48.
- a. yes
 - b. no
 - c. yes
- 49.
- a. odd
 - b. neither
 - c. even
50. $(-3, 8)$
51. symmetry about the y -axis
52. $(-5, -7)$
53. symmetry about the origin
- 54.
- a. 3
 - b. $-\infty$
 - c. The zeros are 0 (multiplicity 1) and -3 (multiplicity 2)
 - d. $(-1, 4)$
 - e. $(-3, 0)$
 - f. $[-3, -1]$

55. a. 4
b. ∞
c. the zeros are -1 (multiplicity 2) and 3 (multiplicity 2)
d. $(1,16)$
e. $(-1,0);(3,0)$
f. $(-\infty,-1];[1,3]$
56. $f(x) = -2x(x+2)^2$
57. $g(x) = \frac{1}{2}x(x+1)(x-2)^2$
58. a. $3x^2 + 2x + 2$
b. $-x^2 + 2x - 16$
c. 4
d. 3
e. $5x^3 + 13x^2 - 29x - 21$
f. $2x^4 + 4x^3 - 5x^2 + 18x - 63$
59. a. no. there is a non-zero remainder (145)
b. $f(9) = 145$
60. a. 0
b. the remainder is zero
c. $f(x) = (x-3)(x^2 + 6)$
61. a. $f(8) = 8^3 - 7(8)^2 - 8 - 56 = 0$
b. x -intercept
c. $x - 8$
d. 0
e. If I solve $x^2 + x + 7 = 0$, I find that the zeroes are non-real, or if I graph $y = x^2 + x + 7$, I find that there are no x -intercepts.

62. Your graph may vary, but should have similar characteristics.

