

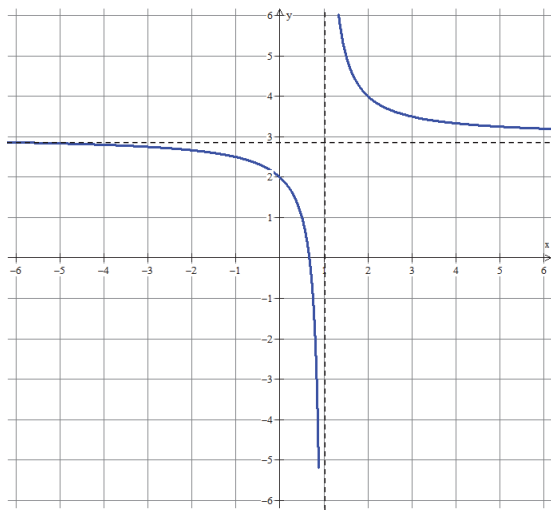
Honors Algebra 2 B
Semester Exam Review
2015-2016
Answers

Unit 2, Topic 3

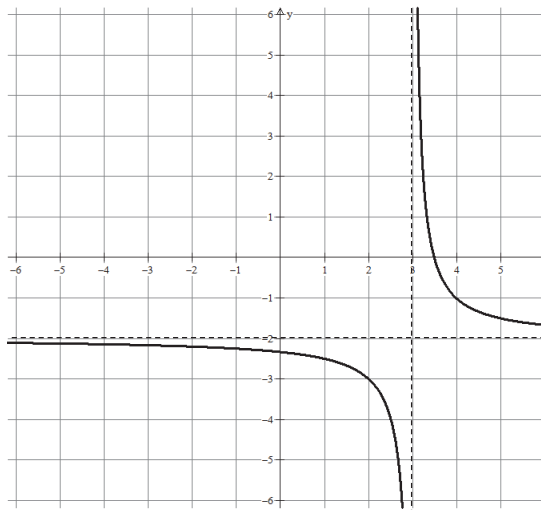
1. a. $y = -1 + \frac{1}{x+2}$

b. $y = \frac{-2}{x}$

2. a.



b.



3. a. LCM = $(x-3)(x+2)$

Solution is $x = -\frac{29}{2}$

b. LCM = $(x+2)(x-2)$

Solutions are $x = 2, x = -2$, with both being extraneous.

4.

	Function $f(x) = \frac{1}{x}$	Function $g(x) = \frac{1}{x^2}$
Even, odd, or neither	Odd	Even
Domain	All real numbers but 0	All real numbers but 0
Range	All real numbers but 0	All positive real numbers
End behavior as $x \rightarrow -\infty$	$f(x) \rightarrow 0$	$g(x) \rightarrow 0$
End behavior as $x \rightarrow \infty$	$f(x) \rightarrow 0$	$g(x) \rightarrow 0$

5. a. 15 hours
 b. inversely
 c. $H = \frac{15}{n}$
 d. 3.75 hours

6. $H = \frac{200}{s}$

7. a. Method 1 or Method 2

$$2 + \frac{1}{x+3}$$

$$\frac{2(x+3)}{x+3} + \frac{1}{x+3}$$

$$\frac{2x+6+1}{x+3}$$

$$\frac{2x+7}{x+3}$$

$$x+3 \overline{) \frac{2}{2x+7}}$$

$$\underline{2x+6}$$

$$1$$

$$2 + \frac{1}{x+3}$$

- b. Vertical asymptote is $x = -3$. Horizontal asymptote is $y = 2$.

8. a. Method 1 or Method 2

$$5 - \frac{1}{x-4}$$

$$\frac{5(x-4)}{x-4} - \frac{1}{x-4}$$

$$\frac{5x-20-1}{x-4}$$

$$\frac{5x-21}{x-4}$$

$$x-4 \overline{) \frac{5}{5x-21}}$$

$$\underline{5x-20}$$

$$-1$$

$$5 - \frac{1}{x-4}$$

- b. Vertical asymptote is $x = 4$. Horizontal asymptote is $y = 5$.

9. a. $\frac{250+6(10)}{10} = \$31$

b.

$$\frac{250+6x}{x} = 11$$

$$250+6x = 11x$$

$$5x = 250$$

$$x = 50 \text{ cakes}$$

10. a. $\frac{500+8(22)}{22-2} = \frac{676}{20} = \33.80

b.

$$\frac{500+8x}{x-2} = 18.75$$

$$500+8x = 18.75(x-2)$$

$$500+8x = 18.75x - 37.50$$

$$537.50 = 10.75x$$

$$x = 50 \text{ fruitcakes}$$

Unit 3

11.

Values of x and y	Quadrant of the Angle θ	Sign of $\sin \theta$	Sign of $\cos \theta$
x is positive, y is positive	1	Positive	Positive
x is positive, y is negative	4	Negative	Positive
x is negative, y is positive	2	Positive	Negative
x is negative, y is negative	3	Negative	Negative

12. a.

$$\sin \theta = \frac{\sqrt{5}}{3}$$

$$\cos \theta = \frac{2}{3}$$

$$\tan \theta = \frac{\sqrt{5}}{2}$$

$$\theta = 48.2^\circ$$

b.

$$\sin \theta = \frac{1}{\sqrt{17}}$$

$$\cos \theta = -\frac{4}{\sqrt{17}}$$

$$\tan \theta = -\frac{1}{4}$$

$$\theta = 166.0^\circ$$

13. $-\frac{12}{13}$

14. All statements should be selected.

15. a. $\frac{80}{360}(2\pi)$ or $\frac{160\pi}{360}$ or $\frac{4\pi}{9}$ or 1.396 units

b. \overline{RF}

c. \overline{OF}

d. $\frac{RF}{OF}$

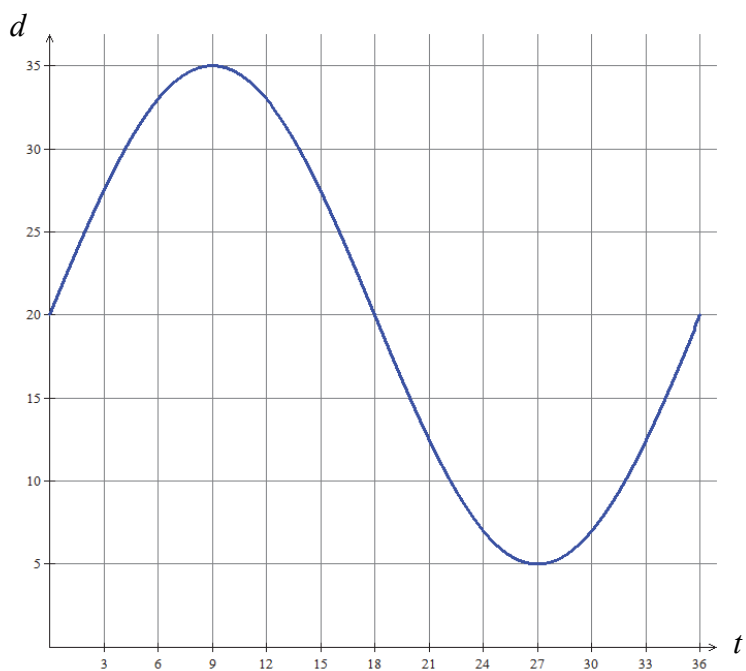
e. 100° or 440° (or any integer multiples of 360° added to or subtracted from these)f. 280° or 440° (or any integer multiples of 360° added to or subtracted from these)16. a. Amplitude: 20, Period: 8, Equation of midline: $y = 30$ b. Amplitude: 8, Period: $\frac{\pi}{2}$, Equation of midline: $y = 10$

17. a. $g(x) = 3 \cos x$
 b. $h(x) = \cos(x + 4) + 6$
 c. $k(x) = \cos\left(\frac{1}{7}x\right)$
 d. $p(x) = \frac{1}{2} \cos(2x)$

18. a. 29.6 feet
 b. 33.4 feet
 c. 8.5 feet
 d. $20 + 15 \sin(40^\circ) = 29.6$

19. a. 22.6 feet
 b. 7.0 feet
 c. 8.5 feet
 d. Since one complete circle takes 36 seconds, the pony rotates 10 degrees per second. Since we want to know where the pony is was 31 seconds, there is a 310 degree rotation, so $20 + 15 \sin(310^\circ) = 8.5$.

20.



21. Amplitude: 15, Period: 36, Equation of midline: $y = 20$

22. $d = 20 + 15 \sin(10^\circ \cdot t)$ or $d = 20 + 15 \sin\left(\frac{\pi}{18} \cdot t\right)$

23. a. This is not a good idea. There is no explanation as to what was done, and there are only 5 values in the table.

b. $d(2) = \frac{320}{2^2} = \frac{320}{4} = 80$; $d(4) = \frac{320}{4^2} = \frac{320}{16} = 20$

c. All positive real numbers

d. If the table were used, I'd have to continue the table until I got to 1.6 lux, or keep measuring using my device until I got 1.6 lux, then measure the distance.

If the formula were used, I would solve the equation $1.6 = \frac{320}{d^2}$. It looks like a simple equation to solve. I would probably do this.

If the graph were used, I would go up the y -axis to 1.6, then go across until I found the corresponding x -value on the graph. It would be hard to do on this graph due to its scale.

24. Recursive model:

$$f(1) = 1$$

$$f(2) = 1 + 2^2 = 5$$

$$f(3) = 5 + 3^2 = 14$$

$$f(4) = 14 + 4^2 = 30$$

The recursive model is appropriate.

Explicit model:

$$f(1) = \frac{(1)(1+1)(2(1)+1)}{6} = \frac{(1)(2)(3)}{6} = \frac{6}{6} = 1$$

$$f(2) = \frac{(2)(2+1)(2(2)+1)}{6} = \frac{(2)(3)(5)}{6} = \frac{30}{6} = 5$$

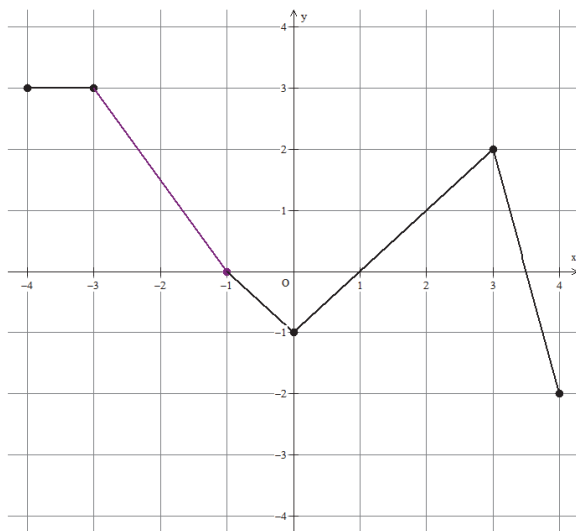
$$f(3) = \frac{(3)(3+1)(2(3)+1)}{6} = \frac{(3)(4)(7)}{6} = \frac{84}{6} = 14$$

$$f(4) = \frac{(4)(4+1)(2(4)+1)}{6} = \frac{(4)(5)(9)}{6} = \frac{180}{6} = 30$$

The explicit model is appropriate.

25. a. sine (or cosine) and exponential
 b. sine (or cosine) and quadratic
26. a. Some type of trig function (sine or cosine). The data appear to be periodic.
 b. This is not a good model. When I tried to evaluate it at $x = 0$, I got 40, not 0. If I replace sin with cos it will work. (There are other possibilities.)

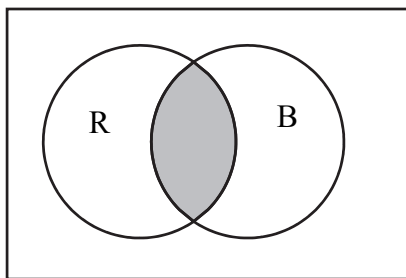
27.



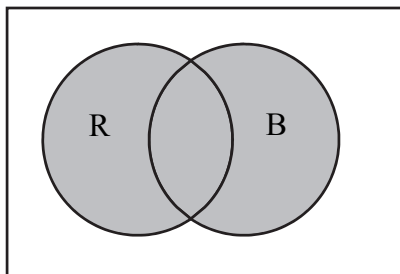
Unit 5

28. 12

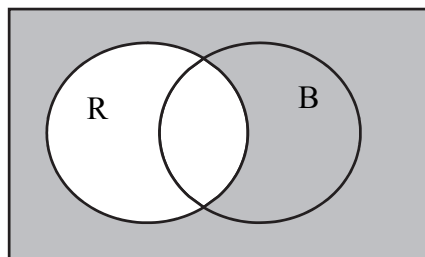
29. a.



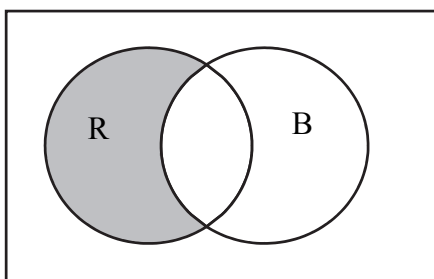
b.



c.



d.



30. a. $\frac{80}{100} = \frac{4}{5} = 0.8 = 80\%$
- b. $\frac{30}{100} = \frac{3}{10} = 0.3 = 30\%$
- c. $\frac{14}{100} = \frac{7}{50} = 0.14 = 14\%$
- d. $\frac{24}{100} = \frac{6}{25} = 0.24 = 24\%$
- e. $\frac{30+20-6}{100} = \frac{44}{100} = \frac{11}{25} = 0.44 = 44\%$
- f. $\frac{70+80-56}{100} = \frac{94}{100} = \frac{47}{50} = 0.94 = 94\%$
- g. $\frac{14}{70} = \frac{2}{10} = \frac{1}{5} = 0.2 = 20\%$
- h. $\frac{24}{80} = \frac{3}{10} = 0.3 = 30\%$
- i. Yes they are independent. The probability that a person likes hockey is the same whether the person is male or female. $P(H|M) = 0.7 = P(H|F)$
31. a. 50%
- b. 60%
- c. 8%
- d. 82%
- e. $\frac{8\%}{50\%} = \frac{8}{50} = 0.16 = 16\%$
- f. $\frac{8\%}{40\%} = \frac{8}{40} = 0.2 = 20\%$
- g. 18%
32. $(0.4)(0.4)(0.4) = 0.064 = 6.4\%$
33. $(0.7)(0.6) = 0.42 = 42\%$

34. $\frac{5}{11} \cdot \frac{4}{10} \cdot \frac{3}{9} = \frac{60}{990} = \frac{2}{33} \approx .061 \approx 6.1\%$

35. a. 68%

b. 2.5%

c. 49.85%

d. 16%

e. If I compute a z -score for 24 days, I get $z = \frac{24-14}{2} = 5$, meaning that this insect's life span is 5 standard deviations above the mean. This would be quite unusual.

36. a. greater

b. greater

37. All should be selected.

38. z -scores should be computed for each store and compared.

Goldie's Store: $z = \frac{25.9-22.6}{2.2} = 1.5$

Ahmed's Store: $\frac{17.9-15.1}{1.4} = 2$

Ahmed's sales were two standard deviations above the mean sales for New York, while Goldie's sales were 1.5 standard deviations above the mean sales for Milwaukee.

Ahmed's store should get the reward.

39. z -scores should be computed for each store and compared.

Jose's Store: $z = \frac{31.7-52.9}{6.3} \approx -3.365$

Jamal's Store: $\frac{14.4-30.2}{4} = -3.95$

Jose's sales were about 3.365 standard deviations below the mean for New York stores, while Jamal's sales were 3.95 standard deviations below the mean for Seattle stores.

The manager of Jamal's store should be fired.

40. a. 29

b. 23