

**Chapter 7B**

1. Factor completely. a.  $2x^2 - 15x + 7$  b.  $4x^3 - 16x^2$  c.  $4x^2 + 10x - 24$  d.  $3x^2 - x - 10$

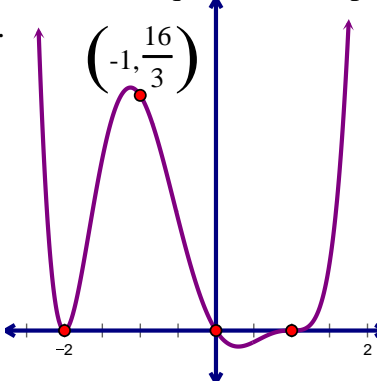
2. Simplify. a.  $-2(x-1)(x+4)(x-5)$  b.  $2x(x^2-5)+5x(3x+4)$

3. Solve by factoring. a.  $x^3 - x^2 + 7x - 7 = 0$  b.  $x^4 - 16 = 0$  c.  $3x^3 - 16x^2 + 5x = 0$

4. Use long division for each of the following: a. Factor  $x^3 + 10x^2 + 11x - 70$  if 2 is a root

b. Is  $x+4$  a factor of  $3x^3 + 32x^2 + 81x + 4$ ? c. Divide  $x^3 - x^2 - 17x + 15$  by  $(x-3)$

5. Write the equation of the polynomial in factored form.

- a.  b. A cubic function with  $x$ -intercepts at  $(-2, 0)$ ,  $(7, 0)$  and  $(10, 0)$  and  $y$ -intercept at  $(0, -700)$

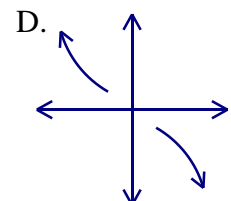
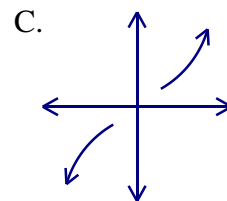
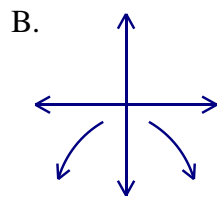
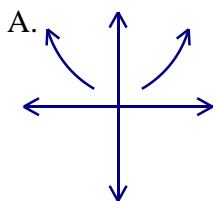
6. a. Multiple Choice: Determine the end behavior of each function.

i.  $f(x) = x^3(2x-1)(-x+4)(3x-5)$

ii.  $g(x) = -(x-4)^4(x+10)^2(x-5)$

iii.  $h(x) = 14x^{12} - x^4 + 8x^{10} + 56$

iv.  $j(x) = -3x^7 + 15x^9 - 20x^{10} + 4x^{11}$



b. list the leading coefficient,  $x$ -intercepts and  $y$ -intercept for  $f(x)$  and  $g(x)$  above.

7. Sketch a complete graph of each function.

a.  $f(x) = x^2(x-3)^3(x+2)(x+3)^2$  b.  $g(x) = -x(x+1)^2(x-1)^2$

8. Solve for  $x$ : a.  $0 = x^2 - 4x + 20$  b.  $5x^2 + 20x = -25$

9. Determine the vertex and the roots of the quadratic: a.  $y = 4x^2 + 8x - 15$  b.  $y = 3x^2 + 18x - 21$

10. Expand  $(w-z)^6$

11. Expand  $(2x+3y)^4$

## Chapter 8

1. The Mariners' team record is 20 wins and 45 losses. How many consecutive games must the team win so that its winning record reaches over 50%?

2. Regular trail mix contains 75% peanuts and 25% M&Ms. A new trail mix is developed for children with a composition of 50% peanuts and 50% M&Ms. If we have 12 ounces of regular trail mix, how many ounces of M&Ms do we need to add to match the new formula for trail mix?

3. Simplify.

a.  $\frac{2x^3}{x^2-x-6} \cdot \frac{x^2-9}{4x+12}$

b.  $\frac{7}{x+6} + x+5$

c.  $\frac{9x+12}{x^2-3x-18} \div \frac{9x^2-16}{x^2-2x-24}$

d.  $\frac{15x+20}{5x^2} \div \frac{3x^2+x-4}{25x}$

4. Identify the domain.

a.  $f(x) = \frac{x+6}{x^2-3x-10}$

b.  $g(x) = \frac{2x-6}{2x^2-x-15}$

c.  $f(x) = \frac{x^2-2x-15}{(x+3)(x-1)(x+2)}$

d.  $g(x) = \frac{(x+1)(x+3)}{(x+4)(x+1)(x-1)(x+3)}$

5. Write the equation of the function when the parent function  $y = \frac{1}{x}$  has been translated left 4, down 3, reflected over the  $x$ -axis and vertically dilated by a factor of 5.

6. Write the equation of the function when the parent function  $y = \frac{1}{x^2}$  has been translated right 8, up 6, and vertically dilated by a factor of 4.

7. If the distance between two points is  $\sqrt{74}$  and the points are  $(x, 3)$  and  $(4, -2)$ , solve for  $x$ .

8. Sketch a complete graph of  $(y-6)^2 = 24(x+4)$ . Include the vertex, the focus, and the directrix.

9. A conic has standard form  $x^2 + y^2 - 8x + 12y + 3 = 0$ . Find the center and the radius.

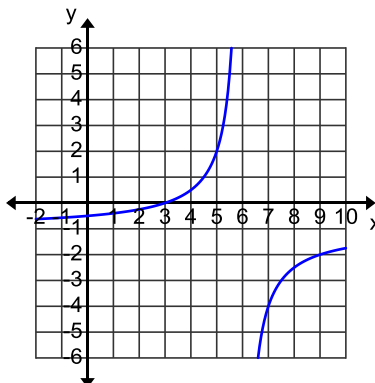
10. Given the equation, find the domain, range and asymptotes. Then sketch a complete graph.

a.  $f(x) = \frac{1}{x+5} + 2$

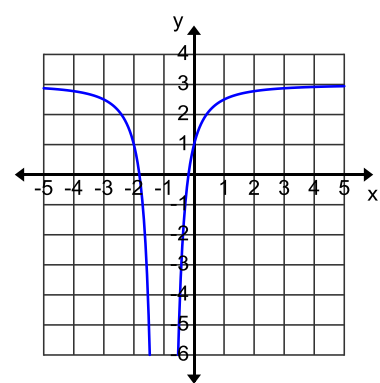
b.  $g(x) = \frac{4}{x^2} + 1$

11. Find the equation of each function.

a.



b.



## Chapter 9

1. Evaluate.

a.  $\sum_{n=1}^4 (3n-5)$       b.  $\sum_{n=1}^5 (11-2n)$       c.  $\sum_{n=1}^7 n(n+1)$       d.  $\sum_{n=1}^5 10 \cdot 2^{n-1}$       e.  $\sum_{n=1}^{\infty} \left(\frac{4}{5}\right)^{n-1}$   
f.  $\sum_{n=1}^{\infty} 4(0.6)^{n-1}$       g.  $5+6.2+7.4+\dots+17$       h.  $u_1 = 4, r = 3, S_{10} = \underline{\hspace{2cm}}$

2. Write each series in sigma notation.

a.  $\frac{1}{3^7} + \frac{1}{3^8} + \frac{1}{3^9} + \frac{1}{3^{10}} + \frac{1}{3^{11}}$       b.  $3+7+11+15+\dots+u_{20}$       c.  $2+6+18+54+\dots+u_{12}$

3. Determine the type of sequence and write the sum in sigma notation.

a.  $100+93+86+79+\dots+u_{40}$       b.  $500+100+20+4+\dots+u_{17}$

4. If Stan saves \$0.50 the first day of the month, \$1.00 the second day, \$2.00 the third day, etc, how much has he saved after 11 days?

5. Stella saves \$0.50 the first day of the month, \$1.00 the second day, \$1.50 the third day, etc, how much has she saved after 11 days?

6. Consider the sequence 3600, 2520, 1764, ...      a. find  $u_{17}$       b. find  $S_{17}$

7. A 10-year lease states that the annual rent for a retail space is \$45,000 the first year and will increase by 5.3% each additional year of the lease. What will be the total rent expense for the 10-year lease?

8. A child on a swing is given a big push. She travels 12 feet on the first back-and-forth swing, but only  $\frac{5}{6}$  as far on each successive back-and-forth swing. How far (total distance) does she travel before the swing stops?

## Chapter 11

1. Sally was told that her test average is 70.72 in math, but she can only find 4 of her old tests, which she scored 60.4, 64, 65, and 66.2 on. If there were 5 tests given during the semester, what did she score on the missing test?

2. For a normal curve with  $\mu = 8$  and  $\sigma = 6$ , what values will have an area of approximately 34%?

3. The number of cells in a sample of kidney tissue is normally distributed with  $\mu = 4200$  and  $\sigma = 300$ .

a. What percentage of the samples would have 4800 cells or more?

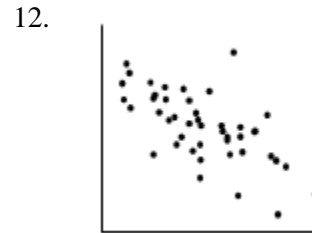
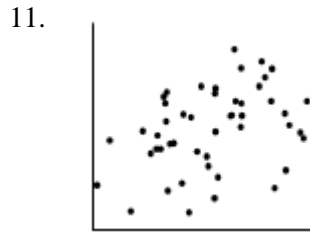
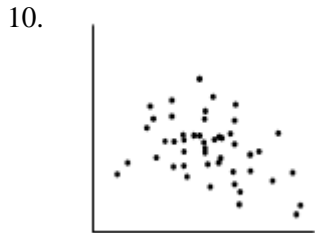
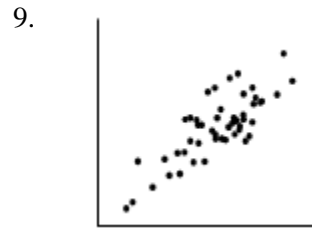
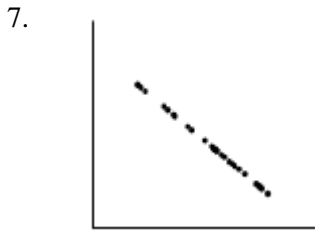
b. What percentage of the sample would have between 3600 and 4500 cells?

4. Find the percent of cases falling between  $z = -2$  and  $z = 3$ .

5. The diameters of a wooden dowel produced by a new machine are normally distributed with  $\mu = 0.4$  in. and  $\sigma = 0.03$  in. What percent of the dowels have a diameter less than 0.31 in?

6. Find the z-score for the 99.85<sup>th</sup> percentile.

Match the scatterplot with the most appropriate  $r$ -value to the right.

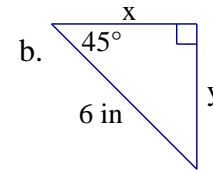
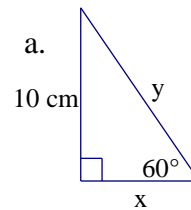


- $r = 0.3$
- $r = -1$
- $r = 0.8$
- $r = -0.4$
- $r = 0$
- $r = 1$
- $r = -0.7$

## Chapter 12

1. A right triangle  $\triangle ANT$  has  $A = 47^\circ$  and hypotenuse  $n = 42$  ft. Solve the triangle.

2. Solve for  $x$  and  $y$ . Leave your answers in exact form.



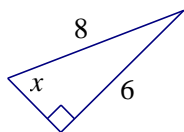
3. Solve each triangle. a.  $a = 6$ ,  $b = 15$ ,  $c = 11$     b.  $A = 12^\circ$ ,  $B = 26^\circ$ ,  $c = 35$     c.  $C = 31^\circ$ ,  $a = 9$ ,  $b = 6$

4. How tall is a bridge if a 6-ft-tall person standing 1000ft away can see the top of the bridge at an angle of  $30^\circ$  to the horizon?

5. A surveying crew is given the job of measuring the depth of a canyon. From a point on level ground, the angle of depression to the bottom of the canyon is  $32^\circ$ . If they back up 207 ft, they still have a clear view of the bottom, but the angle of depression has changed to  $14^\circ$ . What is the depth of the canyon?

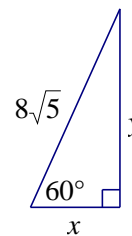
6. Simplify. a.  $\frac{12}{\sqrt{5}}$     b.  $\frac{5\sqrt{3}}{\sqrt{15}}$     c.  $\sqrt{\frac{25}{3}} \cdot \sqrt{\frac{7}{9}}$

7. Given the triangle find:



- a.  $\cos x$
- b.  $x$

8. Find  $x$  and  $y$ .



## Chapter 13

1. Convert to radians or degrees.

a.  $\frac{5\pi}{9}$       b.  $72^\circ$

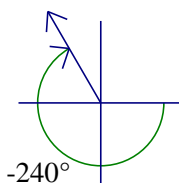
2. Sketch the angle on a set of axes, then find the reference angle.

a.  $\frac{10\pi}{3}$       b.  $-\frac{11\pi}{6}$

3. Identify all angles in the domain

$-720^\circ < x < 360^\circ$  that are coterminal

with the angle in the diagram.



4. Find the exact value.

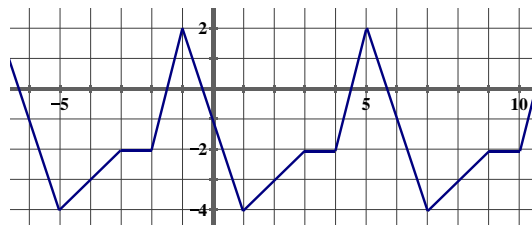
a.  $\sin \frac{3\pi}{4}$       b.  $\cos 300^\circ$       c.  $\sin \frac{7\pi}{6}$   
 d.  $\cos \frac{3\pi}{2}$       e.  $\cos(-210^\circ)$       f.  $\sin \frac{23\pi}{6}$

5. Given the range  $[0, 2\pi]$  or  $[0^\circ, 360^\circ]$ , find all values of  $\theta$  that make the statement true.

a.  $\cos \theta = -\frac{\sqrt{2}}{2}$  (D)      b.  $\sin \theta = -\frac{\sqrt{3}}{2}$  (R)      c.  $\cos \theta = 0$  (R)      d.  $\sin \theta = -\frac{1}{2}$  (D)

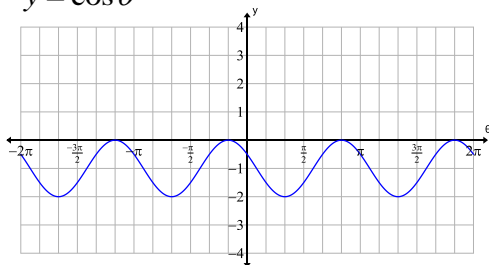
e.  $\cos \theta = \frac{\sqrt{3}}{2}$  (R)      f.  $\sin \theta = -1$  (D)

6. Find the amplitude, period and equation of the axis for the periodic function.

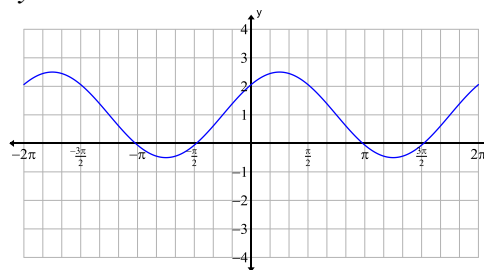


7. Describe the transformations and find the equation of the graph using the indicated function.

a.  $y = \cos \theta$



b.  $y = \sin \theta$



8. List the amplitude, axis, period, and phase shift, then sketch a complete graph of each function.

a.  $f(x) = 2\sin\left(x - \frac{2\pi}{3}\right) + 1$       b.  $g(x) = \cos\left(\frac{3}{2}x\right) - 2$       c.  $h(x) = 3\cos\left(\frac{\pi}{3}x\right)$

9. While at the Puyallup Fair, you decide to ride the Ferris wheel. Your distance above the ground (feet) since you began to move varies sinusoidally with time (seconds) according to the function  $d(t) = 22\cos\frac{\pi}{6}(t-5) + 27$

a. Sketch a complete graph.

b. What is the lowest point that you reach on the wheel? Highest point?

c. How long will it take you to travel all the way around the wheel once?

10. Astronomers have noticed that the number of visible sunspots varies from a minimum of 10 to a maximum of 110 per year. Further, this variation is sinusoidal, repeating over an 11 year period with a low in 1995. Write an equation which represents the number of sunspots at any time  $t$  (number of years after 1995).