Entering Precalculus Honors Summer Homework



Name

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Please read all instructions before beginning this packet.

Show all work in a separate notebook with lined paper. Use graph paper when appropriate. All work should be completed in pencil. Answers may be transfered to the printed worksheets.

Submit the completed printed packet and work when you return to school in August.

To maintain your academic progress, the math department at CSN expects you to spend approximately one hour per week working on these problem sets. All problems can be completed without a calculator. When prompted to use a graphing utility, please use Desmos online graphing calculator.

Your grade will be based on:

- Completion
- Accuracy
- A beginning-of-year assessment given during the first week of school

Please give your best effort. This work helps reflect your individual strengths and areas for growth, and it also allows the department to analyze overall student performance. Teachers will use this information to adjust instruction and better support your learning.

Please reach out to your teacher or the department chair with any questions or concerns.

PCH
Notes Ch 0

Name_____

Linear Relations

Naming lines

Slope Intercept $y = mx + b$

Point- Slope $y - y_1 = m(x - x_1)$

General Linear Form $ax + by + c = 0$ (a, b, and c should be integers with a>0)

Slope $m = \frac{\Delta y}{\Delta x} = \frac{y_1 - y_2}{x_1 - x_2}$

Coordinate Relations

Distance Formula $d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

Naming a circle with center *(h,k)* and radius *r*: $r^2 = (x - h)^2 + (y - k)^2$

(hey- it's the distance formula)

Midpoint: $(x, y) = (\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$

Intercepts: points where a graph crosses the *x* and/or *y*-axis

Solving Equations

- When taking the square root of an equation consider the $\pm$ roots
- If an expression in an equation is raised to a fractional power, raise the entire equation to the reciprocal power. If the denominator of the reciprocal is even consider the $\pm$ roots
- For absolute value equations, once the absolute value is isolated, set the expression equal to the $\pm$ value of the non-absolute value.

Functions

- Function: If a set of relations *(x,y)* has each *x* matching up with only one *y* then the set of relations is a function. If you graph the set of relations and they pass the vertical line test then relations form a function.
- Domain: all possible inputs (*x*-values)
- Range: all possible outputs (*y*-values)
- Extremas: maximum and minimum values of a function
- Increasing/ decreasing relations: all considerations start from the left and move to the right of a function
- Even functions: Given *f(x)*, if *f(-x)=f(x)* then *f(x)* is even. Graphically a reflection over the y-axis. Note: if *(a,b)* is in *f(x)* then so is *(-a,b)*.
- Odd functions: Given *f(x)*, if *f(-x)=-f(x)* then *f(x)* is odd. Graphically a reflection over the origin. Note: if *(a,b)* is in *f(x)* then so is *(-a,-b)*.
- Composition of functions: $f[g(x)] = f \circ g(x) = f \circ g$
- Inverse functions: If $f[g(x)] = g[f(x)] = x$ then f and g are inverses (denoted $f^{-1}(x) = g(x)$). If (a,b) is in f(x) then (b,a) is in g(x). Note: not all functions have inverses that are functions.
- One-to-one: A set of relations are said to be one-to-one if they pass both the vertical and horizontal line tests. This means that both the function and its inverse are functions.

PCH 0-1

Name_____

Please complete all on another sheet of paper.

1. In the following exercises
   i.find the distance between the points,
   ii.find the midpoint of the line segment joining the points
   iii.name the line.

   a. $(-36,-18)$, $(48,-72)$

   b. $(-\frac{1}{3},-\frac{1}{3})$, $(-\frac{1}{6},-\frac{1}{2})$

2. Using **two** different methods show that the points $(0,1)$, $(3,7)$, $(4,4)$, $(1,-2)$ form the vertices of a parallelogram.

3. Find the standard form of the equation of the specified circle:

   a. Center: $(3,-2)$ and solution point: $(-1,1)$

   b. Endpoints of a diameter: $(0,0)$, $(6,8)$

4. Use a graphing utility to graph the equation $y=|x^2-6x+5|$. Find x and y given:

   a. $(2,y)$

   b. $(x,1.5)$

5. Given a rectangle of length x and width w which has a perimeter of 12 meters

   b. Draw a diagram to represent the rectangle. Use specified variables to label its sides.

   c. Show that $w=6-x$ is the width of the rectangle and that $A=x(6-x)$ is its area

   c) Estimate the dimensions of the rectangle that yield a maximum area.

6. Find the general form of the equation of the line that passes through the points $(-1,4)$ and $(6,4)$. Use a graphing utility to sketch the line.

7. Write an equation of the line that passes through the following points x-intercept: $(-5,0)$ and y-intercept: $(0,-4)$

8. Write an equation of the line through the point $(-\frac{2}{3},\frac{7}{8})$ and

a. parallel to $3x+4y=7$

b. perpendicular to $3x+4y=7$

9. Find a relationship between x and y such that (x,y) is equidistant from the two points $(4,-1)$, $(-2,3)$.

10. Find the equation of the line that shows the relationship between the temperature in degrees Celsius C and degrees Fahrenheit F. Remember that water freezes at 0^0 C (32^0 F) and boils at 100^0 C (212^0 F). Note: F and C are linearly related.

11. Explain how you could show that the points A $(2,3)$, B $(2,9)$, and C $(7,3)$ are the vertices of a right triangle.

PCH 0-2

Name_____

1. Solve the equation (if possible). Use a graphing utility to verify your solution.

a. $\frac{100-4u}{3}=\frac{5u+6}{6}+6$

b. $\frac{4}{u-1}+\frac{6}{3u+1}=\frac{15}{3u+1}$

c. $3=2+\frac{2}{z+2}$

2. Find the x and y intercepts of the equation.

a. $y=x^2+x-2$

b. $xy-2y-x+1=0$

3. Solve the equation by extracting the square roots. List both the exact solution **and** the decimal solution rounded to two decimal places.

a. $(2x-1)^2=18$

b. $(x-7)^2=(x+3)^2$

4. Solve the equation by any convenient method☺: $x^2+3x-\frac{3}{4}=0$

5. Find all solutions of the equation. Use a graphing utility to verify the solution graphically.

$x^4+5x^2-36=0$

6. Find all solutions of the equation algebraically. Check your solutions both algebraically and graphically.

a. $\sqrt{x+1}-3x=1$

b. $(x-5)^{2/3}=16$

c. $4x^2(x-1)^{1/3}+6x(x-1)^{4/3}=0$

d. $\dfrac{x}{x^2-4}+\dfrac{1}{x+2}=3$

e. $|x|=x^2+x-3$

f. $|x-10|=x^2-10x$

7. Solve the inequality and sketch the solution on the real number line. $3|4-5x|\le 9$

PCH 0-3

Name_____

1. Determine the domain of the function.

a. $g(y)=\sqrt{y-10}$

b. $f(x)=\sqrt[4]{1-x^2}$

c. $f(s)=\dfrac{\sqrt{s-1}}{s-4}$

d. $f(x)=\dfrac{x-5}{\sqrt[4]{x^2-9}}$

2. Find the difference quotient and simplify your answer.THIS MEANS PLUG IN x+h and x for the given function and simplify.

a. $g(x)=3x-1\,;\ \dfrac{g(x+h)-g(x)}{h},\ h\neq 0$

b. $f(t)=\dfrac{1}{t}\,;\ \dfrac{f(t)-f(1)}{t-1},\ t\neq 0$

c. $f(x)=\dfrac{4}{x+1};\ \dfrac{f(x)-f(7)}{x-7},\ x\neq 7$

3. A right triangle is formed in the first quadrant by the x- and y-axes with intercepts $(x,0)$ and $(0,y)$ and a line through the point $(2,1)$. Write the area of the triangle as a function of x, and determine the domain of the function.

4. A rectangle is bounded by the x-axis and the semicircle $y=\sqrt{36-x^2}$. Draw the picture and write the area of the rectangle as a function of x, and determine the domain of the function.

5. For the following problems

i) use a graphing utility to graph the function

ii) determine the intervals over which the function is increasing, decreasing, or constant

iii) determine whether the function is even, odd, or neither.

a. $f(x)=3x^4-6x^2$

b. $f(x)=x\sqrt{x+3}$

c. $f(x)=|x+1|+|x-1|$

6. Use a graphing utility to graph the piecewise-defined function.

a. $f(x)=\begin{cases} x^2+5, x\le 1 \\ x^2-4x+3, x>1 \end{cases}$

b. $g(x)=\begin{cases} \sqrt{4+x}, x<0 \\ \sqrt{4-x}, x\ge 0 \end{cases}$

7. Algebraically determine whether the function is even, odd, or neither. Verify your answer using a graphing utility.

a. $f(t)=t^2+2t-3$

b. $g(x)=x^3-5x$

c. $h(x)=x^3-5$

8. Identify the coordinates of a second point on the graph of a function f if the given point is on the graph and the function is i) even and ii) odd.

a. $(-5/3,-7)$

b. $(x,-y)$

PCH 0-4

Name_____

1. For the following exercises
   - i) find $f \circ g$ and $g \circ f$
   - ii) graph $f \circ g$ and $g \circ f$
   - iii) determine whether $f \circ g = g \circ f$.

a. $f(x) = x^2$; $g(x) = x - 1$

b. $f(x) = x^3$; $g(x) = \frac{1}{x}$

c. $f(x) = \frac{1}{3}x - 3$; $g(x) = 3x + 1$

d. $f(x) = x^{2/3}$; $g(x) = x^6$

2. Find two functions *f* and *g* such that $(f \circ g)(x) = h(x)$ (There are many correct answers.)

a. $h(x) = (2x+1)^2$

b. $h(x) = (x+4)^2 + 2(x+4)$

3. Find the difference quotient: $\frac{f(x+h) - f(x)}{h}$

a. $f(x) = 4/x$

b. $f(x) = -\sqrt{4x}$

4. Find the inverse of the function f. Use a graphing utility to graph both f and f^{-1} in the same viewing window. Describe the relationship between the graphs.

a. $f(x)=2x-3$

b. $f(x)=x^3+1$

c. $f(x)=\sqrt{4-x^2}$, $0\le x\le 2$

d. $f(x)=\dfrac{6}{\sqrt{x}}$

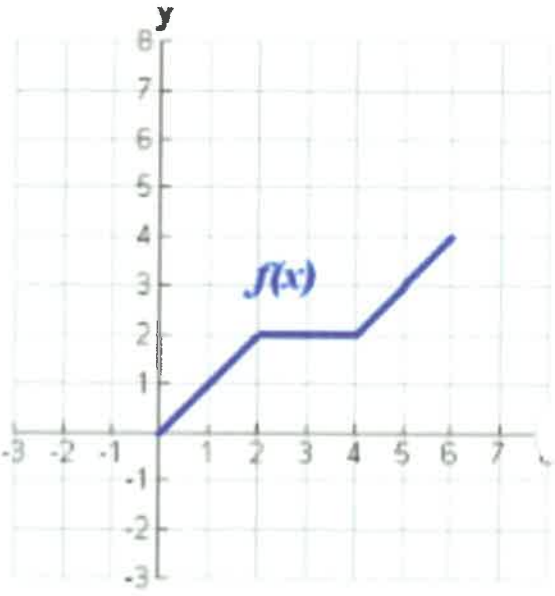
5. A square concrete foundation was prepared as a base for a large cylindrical gasoline tank.

a. Express the radius r of the tank as a function of the length x of the sides of the square.

b. express the area A of the circular base of the tank as a function of the radius r

c. find and interpret $(A\circ r)(x)$

6. Use the graph of f to sketch the graph of the specified function.



a. $f(x+2)$

b. $f(x)+4$

c. $f(x)-1$

PCH 0-5

Name_____

1. Determine algebraically whether the function is one to one. If it is, find its inverse. Verify your answer graphically.

a. $f(x)=(x+3)^2\ ;\ x\geq -3$

b. $h(x)=4/x^2$

c. $f(x)=|x-2|\ ;\ x\leq 2$

d. $f(x)=\dfrac{x^2}{x^2+1}$

2. Use the functions $f(x)=\dfrac{1}{8}x-3$ and $g(x)=x^3$ to find the indicated value or function.

a. $(f^{-1}\circ g^{-1})(1)$

b. $(g^{-1}\circ g^{-1})(-4)$

3. Determine whether the statement is true or false. Justify your answer.

a. If f is an even function f^{-1} exists.

b. If the inverse of f exists, the y-intercept of f is the x-intercept of f^{-1}.

4. If the function $f(x)=k(2-x-x^3)$ is one to one and $f^{-1}(3)=-2$. Find k.

5. If $f(2x)=\dfrac{2}{x+2}$ for all $x>0$, then find $2f(x)$.

6. If $f(x)=\dfrac{4}{x-1}$ and $g(x)=2x$, then find all x such that $f(g(x))=g(f(x))$.

7. Given $g(x)=2x+8$ and $f(x)=\dfrac{1}{x+2}$, find $g\circ f^{-1}(-2)$.

PCH 0-6

Name_____

1. Sketch the graphs of the following functions and state the range in each case. Note: *x* is a member of the set of real numbers

a. $f(x)=x+1, x>1$

b. $f(x)=2x+1, x<1$

c. $f(x)=\dfrac{1}{x+1}$

d. h(x) = $\begin{Bmatrix} -1, x<-1 \\ x, -1\le x\le 1 \\ 1, x>1 \end{Bmatrix}$

e. $f(x)=x-[x]$

f. $f(x)=\left[\dfrac{1}{2}x\right]$

g. $f(x)=[|x|]$

h. $f(x)=\left[x^2-4\right]$

2. Sketch the graph of the function $f(x)=|x-1|$, then sketch the graph of the following functions:

a. $g(x)=2f(x)$

b. $h(x)=f(x+2)$

c. $k(x)=f(x)-3$

d. $l(x)=f(3x)$

3. Which of the following are one-to-one functions? Justify your answer. Note: x is a member of the set of real numbers

a. $f(x)=3x-2$

b. $f(x)=x^2-4x+4$, $x>1$

c. $f(x)=\sqrt{4-x}$, $x<4$

d. $f(x)=\dfrac{1}{3-x}$, $x\neq 3$

e. $f(x)=|2-x|$

f. $f(x)=x^3+x$

g. $f(x)=\dfrac{2x+3}{x-1}$, $x\neq 1$

h. $f(x)=\dfrac{1}{x}, x\neq 0$
$f(x)=0, x=0$

i. $f(x)=2-x, x\leq 1$
$f(x)=2+x, x\geq 1$

j. $f(x)=|x|-1, x\leq -1$
$f(x)=-x^2, x\geq 0$

PCH 0-7

Name_____

1. Find the largest possible domain S, a subset of reals, for which the following are strictly increasing functions.

a. $f(x)=\sqrt{1-x^2}$

b. $f(x)=\sqrt{x^2-9}$

c. $f(x)=\left|\frac{1}{x-2}\right|$

d. $f(x)=x^2+2x$

e. $f(x)=x^2-4x+5$

f. $f(x)=\frac{4x+1}{-x+1}$

2. In each of the following functions, show that $f(-x)=f(x)$ and determine the sign of $f(b)-f(a)$ where *a* and *b* are real number with $b>a\geq 0$ and sketch the graph of the function.

a. $f(x)=\frac{4}{x^2+1}$

b. $f(x)=\frac{x^2-9}{x^2+9}$

c. $f(x)=4x^2-5$

3. In each of the following functions, show that $f(-x)=-f(x)$ and determine the sign of $f(b)-f(a)$ where a and b are real numbers with $b>a\geq 0$ and sketch the graph of the function.

a. $f(x)=3x^3$

b. $f(x)=\dfrac{x^3}{x^2+1}$

c. $f(x)=\dfrac{x^5}{x^2+4}$

d. $f(x)=\dfrac{x}{|x|+1}$

4. Discuss and sketch the graph of each of the following functions:

a. $f(x)=\dfrac{x^2}{x^2-1},\ (x\neq -1,1)$

b. $f(x)=\dfrac{4}{9-x^2},\ (x\neq -3,3)$

c. $f(x)=8x+\dfrac{2}{x},\ (x\neq 0)$

d. $f(x)=2x-\dfrac{1}{x},\ (x\neq 0)$

PCH 0-8

Name_____

1. Find the **sum** of all the real solutions for $\left|x^2\right|-6|x|+8=0$

2. If $y^{\frac{2}{3}}=4, x=y^{-2}$, and $z=x^{-\frac{1}{3}}$ find $(\frac{yz}{x})^{\frac{1}{2}}$

3. The sum of two numbers is 8 and the sum of their cubes is 20, find the sum of their squares.

4. The sum of two numbers is 45. The sum of their quotient and its reciprocal is 2.05. Find the product of these two numbers.

5. The sum of the square roots of two numbers is 5 and the two numbers differ by 5. What are the numbers?

6. Solve for x: $\sqrt{1+\sqrt{3-\sqrt{1+\sqrt{2+x}}}}=1$

7. **How many** real numbers x satisfy $\left|\left|x-2\right|-4\right|-5\Big|=1$

8. Solve for n: $\frac{1}{\sqrt{4}+\sqrt{5}}+\frac{1}{\sqrt{5}+\sqrt{6}}+\frac{1}{\sqrt{6}+\sqrt{7}}+\ldots+\frac{1}{\sqrt{n}+\sqrt{n+1}}=10$

9. Consider that the lines $x-y=2$ and $cx+y=3$ intersect at (x,y) in quadrant I. State the restrictions on c.

PCH 0-9

Name_____

1. Solve for x: $\frac{23^9 - 23^8}{22} = 23^x$

2. Find n if $\frac{1}{n} + \frac{2}{n} + \frac{3}{n} + \ldots + \frac{n-1}{n} = 1999$

3. Solve each of the following

   a. $2^{2x} + 2^x - 2 = 0$

   b. $9^{x+1} - 13(3^x) + 4 = 0$

   c. $125^{x^2} - 0.2(25^x)^2 = 0$

4. Find the x-intercepts of $y = \left|\left|x - 57\right| - 38\right|$

5. Find two numbers such that their sum is one and their product is -1.

6. Find two numbers such that their difference, sum and product are in a 1:4:15 ratio, respectively.

7. For what value(s) of x does $\sqrt{2x} = x\sqrt{2}$

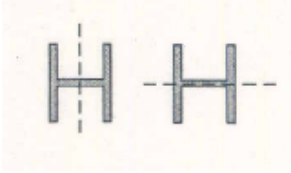
8. The product of two consecutive odd integers added to their sum is 119. What are the two integers?

9. Solve for all complex values x such that $x^4 = 1$

Test 5
Section 7

1. If k is a positive integer divisible by 3, and if $k < 60$, what is the greatest possible value of k?

A. 55
B. 56
C. 57
D. 58
E. 59

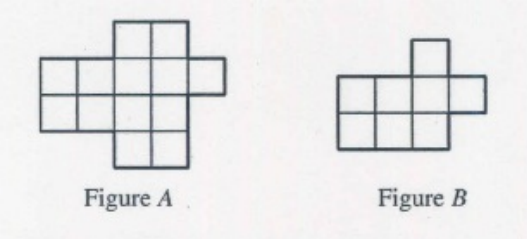


2. The letter H is symmetric with respect to two different lines, as shown by the dotted lines in the figure above. Which of the following letters is symmetric with respect to at least two different lines?

A. W
B. L
C. M
D. X
E. Y

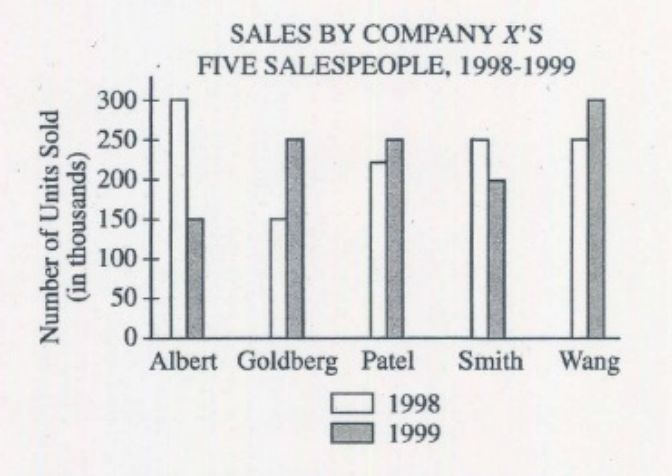
3. Bobby receives $2 for each chore he does during the week, plus a weekly allowance of $10. If Bobby receives no other money, which of the following expressions represents the total dollar amount Bobby receives for a week in which he has done in n chores?

A. $10 + n$
B. $(10 + 2)n$
C. $10n + 2$
D. $10 + 2n$
E. $(10 + n)2$



4. The smallest squares in Figure A and Figure B are all equal in size. If the area of Figure A is 26 square centimeters, what is the area of Figure B?

A. 12 sq cm
B. 14 sq cm
C. 16 sq cm
D. 18 sq cm
E. 20 sq cm

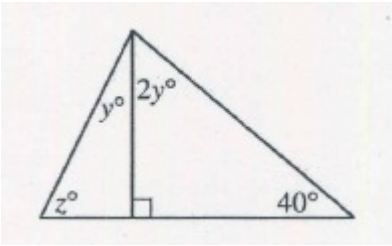


5. According to the graph above, which salesperson had the greatest increase in the number of units sold from 1998 to 1999?

A. Albert
B. Goldberg
C. Patel
D. Smith
E. Wang

6. If the average (arithmetic mean) of 6, 6, 12, 16, and x is equal to x, what is the value of x?

A. 6
B. 8
C. 9
D. 10
E. 11



7. In the figure above, what is the value of x?

A. 55
B. 60
C. 65
D. 70
E. 75

8. A computer program randomly select a positive two-digit integer. If the integer selected is odd, twice that integer is printed. If the integer selected is even, the integer itself is printed. If the integer printed is 26, which of the following could have been the integer selected?

I. 13
II. 26
III. 52

A. I only
B. II only
C. I and II only
D. I and III only
E. I, II, and III

9. How many seconds are there in m minutes and s seconds?

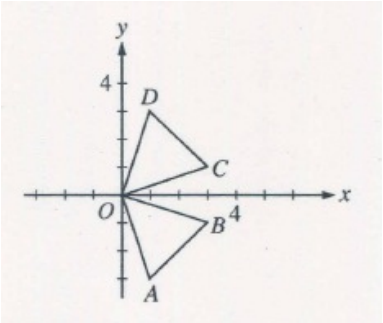
A. $60m + s$
B. $m + 60s$
C. $60(m + s)$
D. $\frac{m + s}{60}$
E. $\frac{m}{60} + s$

10. If $(2x - 2)(2 - x) = 0$, what are all the possible values of x?

A. 0 only
B. 1 only
C. 2 only
D. 1 and 2 only
E. 0, 1, and 2

11. If $x^3 = y^9$, what is x in terms of y?

A. $\sqrt{y}$
B. y^2
C. y^3
D. y^6
E. y^{12}



12. In the *xy*-coordinate system above, which of the following line segments has a slope of -1?

A. $\overline{OA}$
B. $\overline{OB}$
C. $\overline{OC}$
D. $\overline{OD}$
E. $\overline{DC}$

13. Kyle's lock combination consists of 3 two-digit numbers. The combination satisfies the three conditions below.

One number is odd.
One number is a multiple of 5.
One number is the day of the month of Kyle's birthday.

If each number satisfies exactly one of the conditions, which of the following could be the combination to the lock?

A. 14-20-13
B. 14-25-13
C. 15-18-16
D. 20-15-20
E. 34-30-21

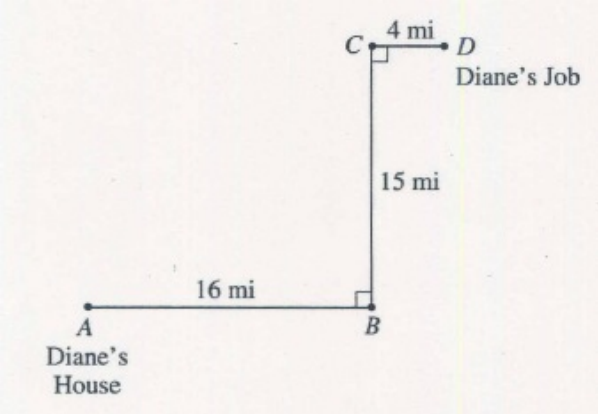
$$\sqrt{x+9} = x - 3$$

14. For all value of x greater than 3, the equation above is equivalent to which of the following?

A. $x = x^2$
B. $x = x^2 + 18$
C. $x = x^2 - 6x$
D. $x = x^2 - 6x + 9$
E. $x = x^2 - 6x + 18$

15. How many integers in the set of all integers from 1 to 100, inclusive, are not the square of an integer?

A. 19
B. 50
C. 81
D. 89
E. 90



16. The figure above shows the route of Diane's trip from her house to her job. Diane travels 16 miles from A to B, 15 miles from B to C, and 4 miles from C to D. If she were able to travel from A to D directly, how much shorter, in miles, would the trip be?

A. 5
B. 8
C. 10
D. 11
E. 15

17. One circle has a radius of $\frac{1}{2}$ and another circle has a radius of 1. What is the ratio of the area of the larger circle to the area of the smaller circle?

A. 2:1
B. 3:1
C. 3:2
D. 4:1
E. 5:2

18. If the sum of the consecutive integers from -22 to x, inclusive, is 72, what is the value of x?

A. 23
B. 25
C. 50
D. 75
E. 94

19. If *k, n, x,* and *y* are positive numbers satisfying $x^{-\frac{4}{3}} = k^{-2}$ and $y^{\frac{4}{3}} = n^2$, what is $(xy)^{-\frac{2}{3}}$ in terms of *n* and *k*?

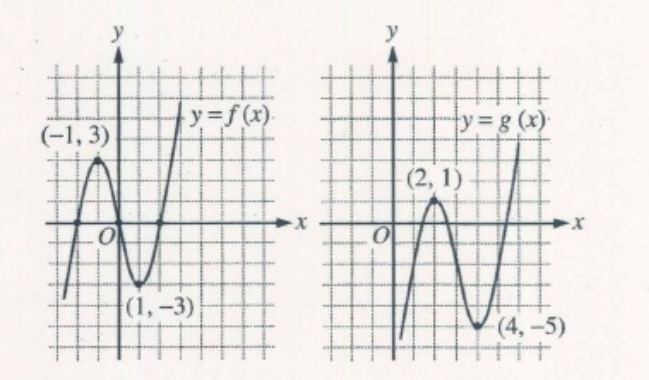
A. $\frac{1}{nk}$

B. $\frac{n}{k}$

C. $\frac{k}{n}$

D. nk

E. 1



20. The figures above show the graphs of the function *f* and *g*. The function *f* is defined by $f(x) = x^3 - 4x$. The function *g* is defined by $g(x) = f(x + h) + k$, where *h* and *g* are constants. What is the value of *hk*?

A. -6

B. -3

C. -2

D. 3

E. 6

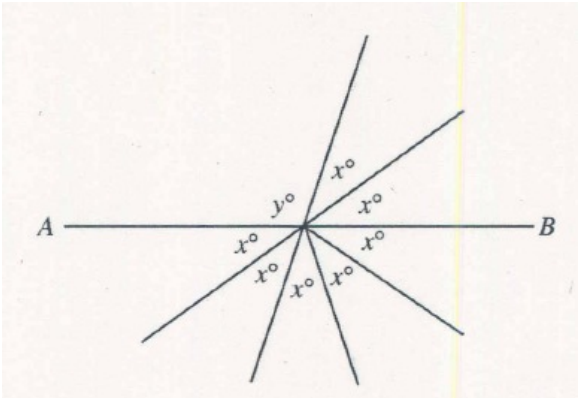
Test 6
Section 3

1. Which of the following numbers is between $\frac{1}{5}$ and $\frac{1}{4}$?

   A. 0.14
   B. 0.15
   C. 0.19
   D. 0.21
   E. 0.26

2. The following are coordinates of points in the *xy*-plane. Which of these points is nearest the origin?

   A. (0, -1)
   B. $\left(0,\frac{1}{2}\right)$
   C. $\left(\frac{1}{2},-\frac{1}{2}\right)$
   D. $\left(\frac{1}{2},\frac{1}{2}\right)$
   E. (-1, -1)



3. In the figure above, if *AB* is a line, what is the value of *y* ?

   A. 108
   B. 114
   C. 117
   D. 120
   E. 135

4. If 6,565 = 65(*x* + 1), then *x* =

   A. 10
   B. 11
   C. 100
   D. 101
   E. 100

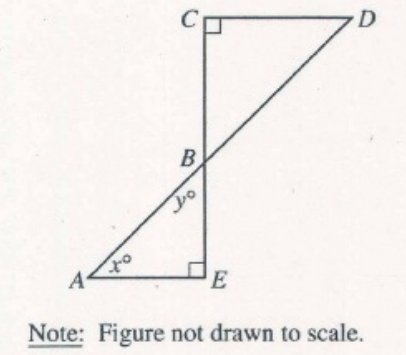
5. If $m^x \cdot m^7 = m^{28}$ and $(m^5)^y = m^{15}$, what is the value of $x + y$?

A. 7
B. 12
C. 14
D. 24
E. 31



6. According to the graph above, which of the following is closest to the decrease per year in the number of homes sold between 1987 and 1990?

A. 7,000
B. 11,500
C. 14,000
D. 17,500
E. 42,000



Note: Figure not drawn to scale.

7. In the figure above, $\overline{AE}$ and $\overline{CD}$ are each perpendicular in $\overline{CE}$. If $x = y$, the length of $\overline{AB}$ is 4, and the length of $\overline{BD}$ is 8, what is the length of $\overline{CE}$?

A. $3\sqrt{2}$ (approximately 4.24)
B. $6\sqrt{2}$ (approximately 8.49)
C. $8\sqrt{2}$ (approximately 11.31)
D. $10\sqrt{2}$ (approximately 14.14)
E. $12\sqrt{2}$ (approximately 16.97)

8. The price of ground coffee beans is d dollars for 8 ounces and each ounce makes c cups of brewed coffee. In terms of c and d, what is the dollar cost of the ground coffee beans required to make 1 cup of brewed coffee?

A. $\frac{d}{8c}$
B. $\frac{cd}{8}$
C. $\frac{8c}{d}$
D. $\frac{8d}{c}$
E. $8cd$

9. If $\frac{10}{a} = \frac{b}{12}$, what is the value of ab?

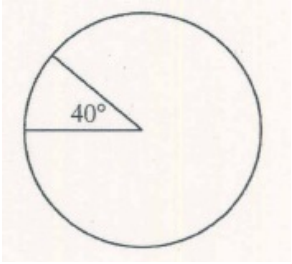
150, 30, 6, …

10. In the sequence above, each term after the 1st term is $\frac{1}{5}$ of the term preceding it. What is the 5th term of this sequence?

11. Five points, *A, B, C, D,* and *E,* lie on a line, not necessarily in that order. $\overline{AB}$ has length of 24. Point C is the midpoint of $\overline{AB}$, and point D is the midpoint of $\overline{AC}$. If the distance between D and E is 5, what is one possible distance between A and E?

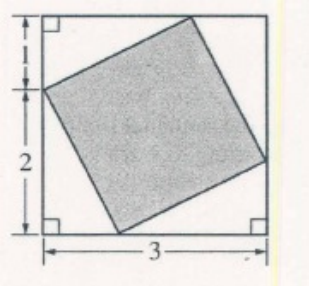
12. What is the greatest of 5 consecutive integers if the sum of these integers equals 185?

13. A salesman's monthly gross pay consists of \$1,200 plus 20 percent of the dollar amount of his sales. If his gross pay for one month was \$2,500, what was the dollar amount of his sales for that month? (Disregard the \$ sign when gridding your answer.)



14. Naomi makes silver jewelry. For one style of earrings she cuts wedges from a silver disk, as shown in the figure above. Each wedge makes a $40°$ angle at the center of the disk. If the weight of each uncut disk is a uniformly distributed 2.5 grams, how many grams does each wedge weigh?

15. If $x^2 - y^2 = 10$ and $x + y = 5$, what is the value of $x - y$?



16. In the figure above, what is the area of the shaded square?

17. For all positive values j and k, let $j\Theta k$ be defined as the whole number remainder when j is divided by k. If $13\Theta k = 2$, what is the value of k?

18. The average (arithmetic mean) of the test scores of a class of p students is 70, and the average of the test scores of a class of n students is 92. When the scores of both classes are combined, the average score is 86. What is the value of $\frac{p}{n}$?

Test 6
Section 7

1. In a certain game, points are assigned to every word. Each *q, x,* and *z* in a word is worth 5 points, and all other letters are worth 1 point each. What is the sum of the points assigned to the word "exquisite"?

A. 21
B. 17
C. 16
D. 13
E. 9

2. If $2x - 10 = 20$, then $x - 5 =$

A. 5
B. 10
C. 15
D. 20
E. 30

3. If t represents an odd integer, which of the following expressions represents an even integer?

A. $t + 2$
B. $2t - 1$
C. $3t - 2$
D. $3t + 2$
E. $5t + 1$