

131. If $f(x) = \frac{x+2}{x-1}$, for which of the following values of x is $f(x)$ undefined?

- A. -2
- B. -1
- C. $\frac{1}{2}$
- D. 1
- E. 2

132. If $f(x) = \frac{2-2x}{x}$, which of the following defines the range of $f(x)$?

- F. All real numbers
- G. All real numbers except -2
- H. All real numbers except 0
- J. All real numbers except 2
- K. All real numbers greater than 2

133. If $|4x-8| < 12$, which of the following defines the possible values of x ?

- A. $-8 < x < -4$
- B. $-4 < x < 8$
- C. $-1 < x < 5$
- D. $1 < x < 5$
- E. $4 < x < 8$

Functions as Models

134. The cost of making a call using a phone-card is \$0.15 for dialing and \$0.04 per minute of connection time. Which of the following equations could be used to find the cost, y , of a call x minutes long?

- F. $y = x(0.04 + 0.15)$
- G. $y = 0.04x + 0.15$
- H. $y = 0.04 + 0.15x$
- J. $y = 0.15 - 0.04x$
- K. $y = 0.04 - 0.15x$

Solving Algebraic Equations with Two Variables

135. If $x + y = 3$, then $2x + 2y = ?$

- A. $-\frac{2}{3}$
- B. $\frac{1}{2}$
- C. $\frac{2}{3}$
- D. 6
- E. Cannot be determined from the given information

Solving Simultaneous Equations

136. If $2x + y = 8$ and $x - y = 1$, then $x = ?$

- F. -2
- G. -1
- H. 0
- J. 1
- K. 3

137. If $7x = 2$ and $3y - 7x = 10$, then $y = ?$

- A. 2
- B. 3
- C. 4
- D. 5
- E. 6

138. If $2x + y = 8$ and $x - y = 1$, what is the value of $x + y$?

- F. -1
- G. 1
- H. 2
- J. 3
- K. 5

139. If $4x + 5y = 12$ and $3x + 4y = 5$, what is the value of $7(x + y)$?

- A. 7
- B. 14
- C. 49
- D. 77
- E. 91

140. Which of the equations that follow correctly describes the relationship between the values shown for x and y in the table below?

x	-2	-1	0	1	2
y	$\frac{10}{3}$	$\frac{8}{3}$	2	$\frac{4}{3}$	$\frac{2}{3}$

- F. $3x + 2y = 6$
- G. $3x - 2y = 3$
- H. $3x + 3y = -6$
- J. $6x + 4y = 7$
- K. $2x + 3y = 6$

Solving Quadratic Equations

141. Which of the following is the solution set for $2x^2 - 2x = 12$?

- A. $\{-3, -2\}$
- B. $\{-2, 3\}$
- C. $\left\{\frac{2}{3}, 3\right\}$
- D. $\left\{\frac{3}{2}, 2\right\}$
- E. $\{2, 3\}$

142. If $x^2 - 3x = 4$, then which of the following shows all possible values of x ?

- F. $\{4, 1\}$
- G. $\{4, -1\}$
- H. $\{-4, 1\}$
- J. $\{-4, -1\}$
- K. $\{-4, 1, 4\}$

143. If $x^2 - y^2 = 0$ and $x + y = 1$, then $x - y = ?$

- A. -1
- B. 0
- C. 1
- D. 2
- E. 4

144. Which of the following is the solution set for $3x^2 + 3x = 6$?

- F. $\{1, -2\}$
- G. $\{1, 2\}$
- H. $\left\{\frac{1}{2}, 1\right\}$
- J. $\left\{\frac{1}{2}, \frac{1}{3}\right\}$
- K. $\{-1, -2\}$

145. Which of the following is the solution set for $2x^2 - 3x = 2$?

- A. $\left\{\frac{1}{2}, 2\right\}$
- B. $\left\{-\frac{1}{2}, 2\right\}$
- C. $\left\{-\frac{1}{2}, -2\right\}$
- D. $\{2, -2\}$
- E. $\{2, 4\}$

Algebra Strategies: "Test-the-Test" and "Plug-and-Chug"

146. Diana spent $\frac{1}{2}$ of her weekly allowance on a new book and another \$3 on lunch. If she still had $\frac{1}{6}$ of her original allowance left, how much is Diana's allowance?
- F. \$24
G. \$18
H. \$15
J. \$12
K. \$9
147. In a certain game, a player had five successful turns in a row, and after each one, the number of points added to his total score was double what was added the preceding turn. If the player scored a total of 465 points, how many points did he score on the first play?
- A. 15
B. 31
C. 93
D. 155
E. 270
148. At a certain firm, d gallons of fuel are needed per day for each truck. At this rate, g gallons of fuel will supply t trucks for how many days?
- F. $\frac{dt}{g}$
G. $\frac{gt}{d}$
H. dgt
J. $\frac{t}{dg}$
K. $\frac{g}{dt}$
149. Y years ago, Paul was twice as old as Bob. If Bob is now 18 years old, how old is Paul today in terms of Y ?
- A. $36+Y$
B. $18+Y$
C. $18-Y$
D. $36-Y$
E. $36-2Y$
150. After filling the car's fuel tank, a driver drove from point P to point Q and then to point R . She used $\frac{2}{5}$ of the fuel driving from P to Q . If she used another 7 gallons to drive from Q to R and still had $\frac{1}{4}$ of a tank left, how many gallons does the tank hold?
- F. 12
G. 18
H. 20
J. 21
K. 35
151. If pencils cost x cents each, how many pencils can be purchased for y dollars?
- A. $\frac{100}{xy}$
B. $\frac{xy}{100}$
C. $\frac{100y}{x}$
D. $\frac{y}{100x}$
E. $100xy$
152. A merchant increased the original price of an item by 10%. If she then reduces the new price by 10%, the final price, in terms of the original price, is equal to which of the following?
- F. a decrease of 11%
G. a decrease of 1%
H. no net change
J. an increase of 1%
K. an increase of 11%

153. Harold is twice as old as Jack, who is three years older than Dan. If Harold's age is five times Dan's age, how old (in years) is Jack?

- A. 2
- B. 4
- C. 5
- D. 8
- E. 10

154. A tank with capacity T gallons is empty. If water flows into the tank from pipe X at the rate of X gallons per minute, and water is pumped out by pipe Y at the rate of Y gallons per minute, and X is greater than Y , in how many minutes will the tank be filled?

- F. $\frac{T}{Y - X}$
- G. $\frac{T}{X - Y}$
- H. $\frac{T - X}{Y}$
- J. $\frac{X - Y}{60T}$
- K. $\frac{60T}{XY}$

155. Machine X produces w widgets in five minutes. Machine X and Machine Y , working at the same time, produce w widgets in two minutes. How long will it take Machine Y working alone to produce w widgets?

- A. 2 minutes, 30 seconds
- B. 2 minutes, 40 seconds
- C. 3 minutes, 20 seconds
- D. 3 minutes, 30 seconds
- E. 3 minutes, 40 seconds

156. If a train travels m miles in h hours and 45 minutes, what is its average speed in miles per hour?

- F. $\frac{m}{h + \frac{3}{4}}$
- G. $\frac{m}{1\frac{3}{4}h}$
- H. $m\left(h + \frac{3}{4}\right)$
- J. $\frac{m + 45}{h}$
- K. $\frac{h}{m + 45}$

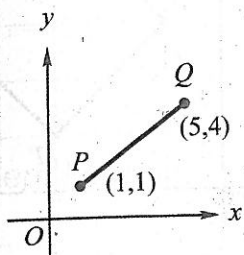
157. On a playground, there are x seesaws. If 50 children are all riding on seesaws, two to a seesaw, and five seesaws are not in use, what is the value of x ?

- A. 15
- B. 20
- C. 25
- D. 30
- E. 35

Coordinate Geometry Review and Strategies

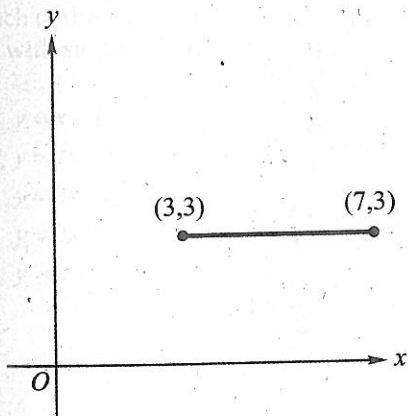
The Coordinate System

158. In the figure below, what is the length of \overline{PQ} ?



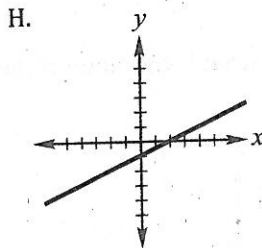
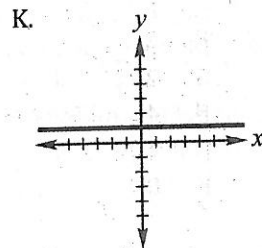
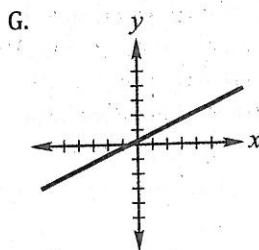
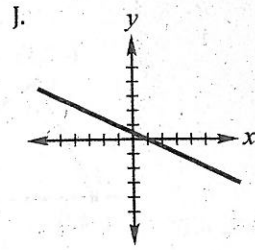
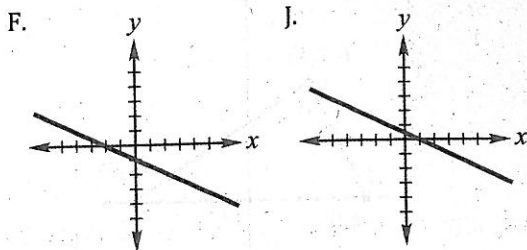
- F. $\sqrt{2}$
- G. $\sqrt{3}$
- H. 3
- J. 4
- K. 5

159. In the figure below, the line segment joining points $(3,3)$ and $(7,3)$ forms one side of a square. Which of the following CANNOT be the coordinates of another vertex of the square?

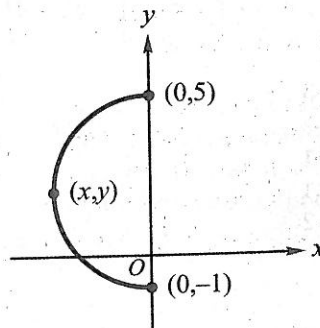


- A. $(3,-1)$
- B. $(3,7)$
- C. $(7,-3)$
- D. $(7,-1)$
- E. $(7,7)$

160. Which of the following is a graph of the line that passes through the points $(-5,3)$, $(-1,1)$, and $(3,-1)$?

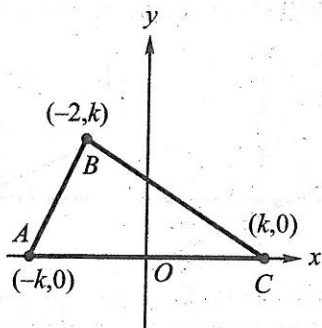


161. In the figure below, what are the coordinates, (x,y) , of the point on the semicircle that is farthest from the y -axis?



- A. $(-4,-4)$
- B. $(-3,-3)$
- C. $(-2,-3)$
- D. $(-3,2)$
- E. $(3,2)$

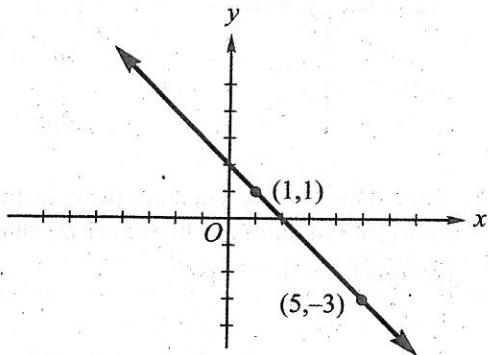
162. In the figure below, the area of $\triangle ABC$ is 8. What is the value of k ?



- F. 2
- G. $2\sqrt{2}$
- H. 4
- J. $4\sqrt{2}$
- K. 8

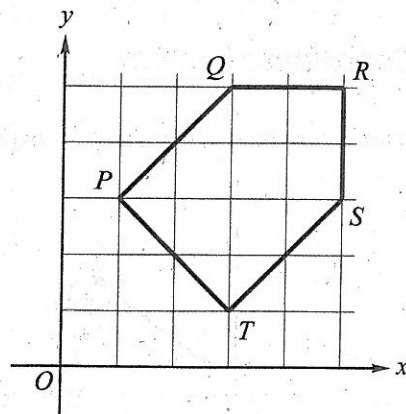
Slope of a Line

163. In the figure below, what is the slope of the line?



- A. -3
- B. -2
- C. -1
- D. 1
- E. 2

164. In the figure below, which two sides of polygon $PQRST$ have the same slope?



- F. \overline{PQ} and \overline{QR}
- G. \overline{PQ} and \overline{RS}
- H. \overline{PQ} and \overline{ST}
- J. \overline{QR} and \overline{RS}
- K. \overline{RS} and \overline{ST}

165. Line l is the graph of the equation $y = \frac{3x}{2} + 2$.

The graph of which of the following equations is perpendicular to line l at $(0, 2)$?

- A. $y = \frac{3x}{2} - 2$
- B. $y = \frac{2x}{3} - 2$
- C. $y = -\frac{2x}{3} + 2$
- D. $y = -\frac{3x}{2} + 3$
- E. $y = -3x + 4$

166. If set $A = \{(-2,3), (-1,1), (-4,-5)\}$, and set $B = \{(3,4), (4,3), (2,-1)\}$, how many lines can be drawn with a positive slope that include exactly one point from set A and one point from set B ?

- F. 2
- G. 3
- H. 4
- J. 5
- K. 6

Slope-Intercept Form of a Linear Equation

167. A line includes the points $(2,3)$ and $(3,6)$. What is the equation of the line?

- A. $y = 2x - 3$
- B. $y = 3x - 3$
- C. $y = \frac{3x - 3}{2}$
- D. $y = 3x + 3$
- E. $y = x - 3$

168. Which of the following is the equation for the line with slope of 2 that includes point $(0,2)$?

- F. $y = x - 1$
- G. $y = 2x - 1$
- H. $y = 2x - 2$
- J. $y = 2x + 2$
- K. $y = x + 1$

169. Which of the following is the equation for the line that includes points $(-1,1)$ and $(7,5)$?

- A. $y = \frac{x}{2} + 2$
- B. $y = \frac{x}{2} + \frac{3}{2}$
- C. $y = \frac{x}{2} + \frac{2}{3}$
- D. $y = 2x + \frac{3}{2}$
- E. $y = 2x + 2$

170. If the graph of a line in the coordinate plane includes the points $(2,4)$ and $(8,7)$, what is the y -intercept of the line?

- F. 6
- G. 4
- H. 3
- J. -1
- K. -3

171. If the slope and y -intercept of a line are -2 and 3, respectively, then the line passes through which of the following points?

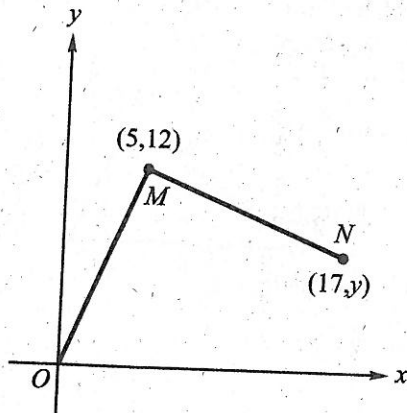
- A. $(-5, -10)$
- B. $(-5, 10)$
- C. $(-2, 3)$
- D. $(3, 4)$
- E. $(4, -5)$

Distance Formula

172. What is the distance between the points $(-3, -2)$ and $(3, 3)$?

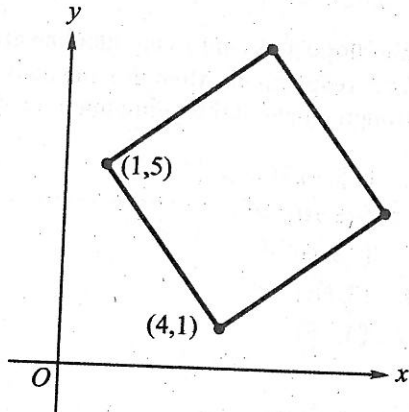
- F. $\sqrt{3}$
- G. $2\sqrt{3}$
- H. 5
- J. $\sqrt{29}$
- K. $\sqrt{61}$

173. In the coordinate plane below, $\overline{MO} \cong \overline{MN}$ and $\overline{MO} \perp \overline{MN}$. What is the value of y ?



- A. 5
- B. 7
- C. 12
- D. 13
- E. 17

174. In the figure below, what is the area of the square region?



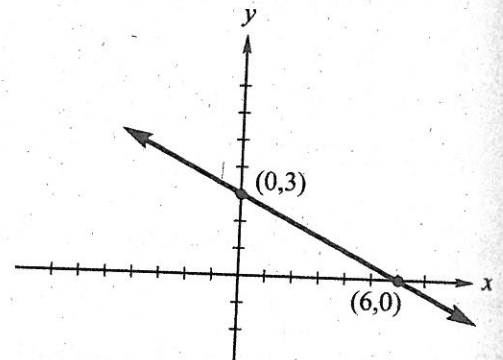
- F. 4
- G. 8
- H. $8\sqrt{2}$
- J. 16
- K. 25

175. In the coordinate plane, what is the midpoint of the line segment with endpoints $(-3, -5)$ and $(5, 7)$?

- A. (1, 1)
- B. (1, 6)
- C. $(3, \frac{7}{2})$
- D. (4, 6)
- E. (8, 12)

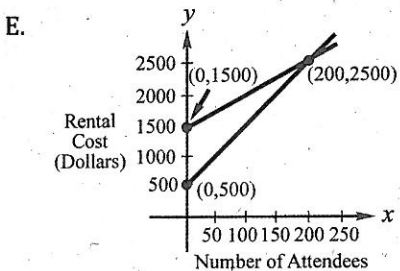
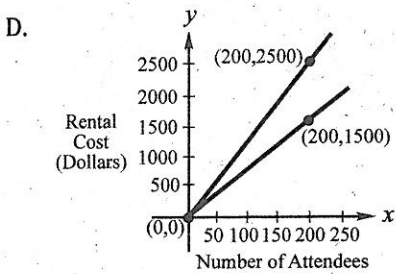
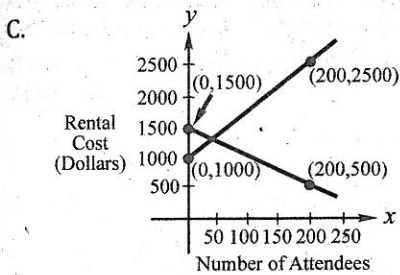
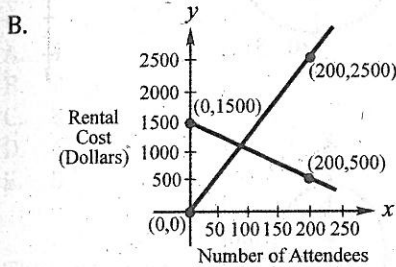
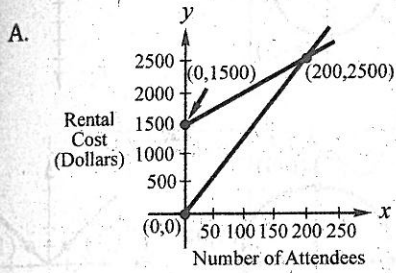
Graphs of Linear Equations

176. The figure below is the graph of which of the following equations?



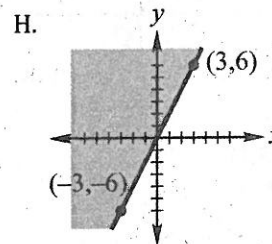
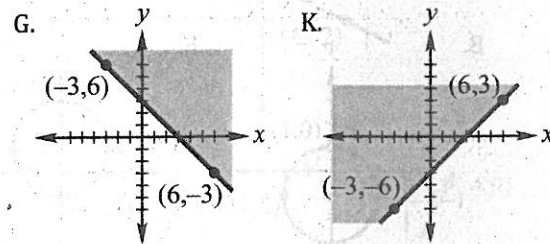
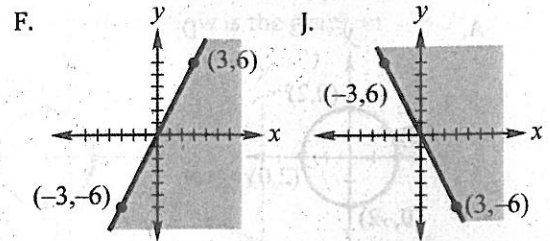
- F. $x + 2y = 6$
- G. $2x + y = 6$
- H. $x + \frac{y}{2} = 6$
- J. $\frac{x}{2} + y = 2$
- K. $x - 3y = 2$

177. A school rented a hotel ballroom for a dance. The cost of the rental is \$1500 plus \$5.00 per person who attends. Each person who attends will pay an admission charge of \$12.50. If x represents the number of people who attend, which of the graphs can be used to determine how many people must attend for the admission charges to cover exactly the cost of renting the ballroom?



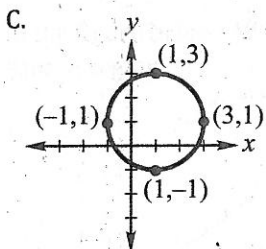
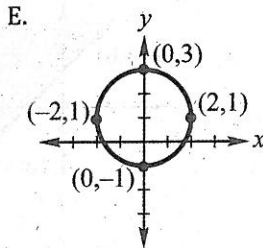
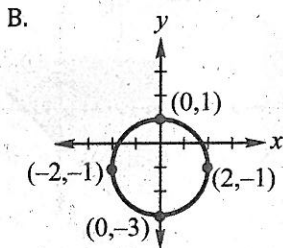
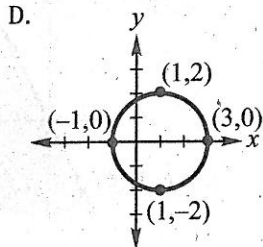
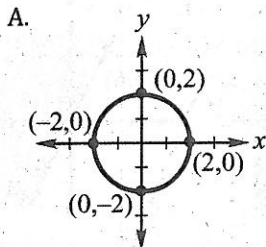
Graphs of First-Degree Inequalities

178. Which of the following is the graph of the inequality $y \geq 2x$?

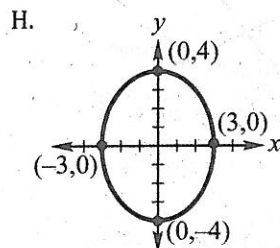
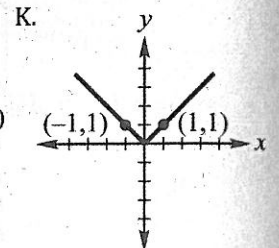
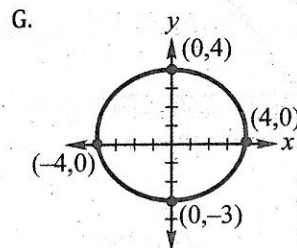
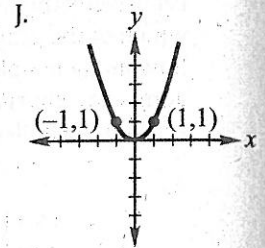
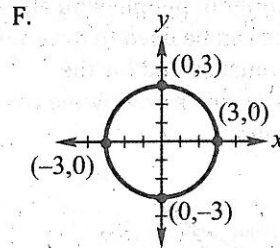


Graphs of Quadratic Equations

179. Which of the following is the graph of the equation $(x-1)^2 + y^2 = 4$?

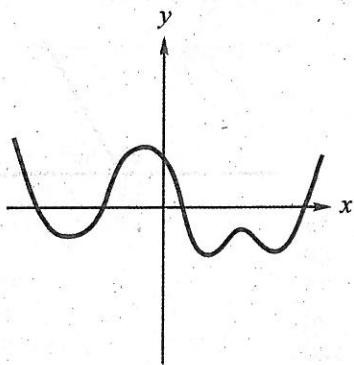


180. Which of the following is the graph of the equation $\frac{x^2}{9} + \frac{y^2}{16} = 1$?



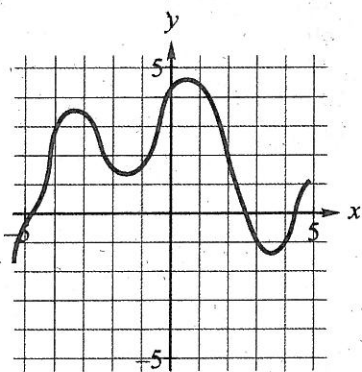
Qualitative Behavior of Graphs of Functions

181. The figure below shows the graph of a function $g(x)$. How many times does the graph cross the x -axis?



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

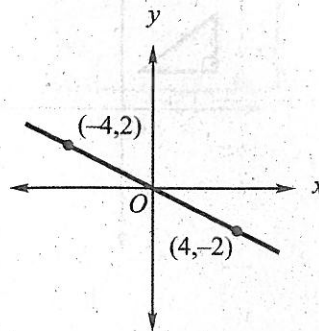
182. The figure below shows the graph of $f(x)$ in the coordinate plane. For the portion of the graph shown, for how many values of x is $f(x) = 3$?



- F. 0
- G. 1
- H. 2
- J. 3
- K. 4

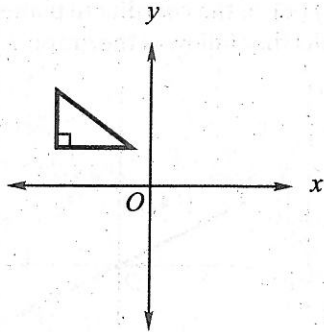
Transformations and Their Effects on Graphs of Functions

183. The figure below represents the graph of $y = f(x)$ in the coordinate plane. Which of the graphs that follow is the graph of $y' = f(x-1)$?

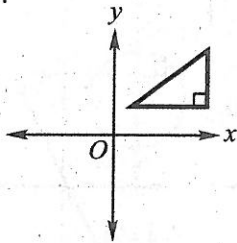


- A.
- B.
- C.
- D.
- E.

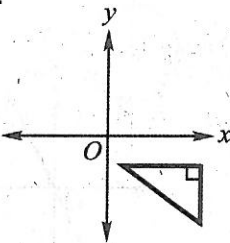
184. If the triangle in the figure below is reflected across the y -axis and then reflected across the x -axis, which of the graphs that follow shows the resulting position of the triangle?



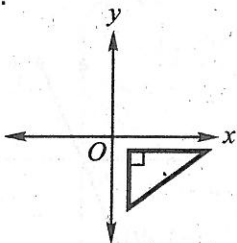
F.



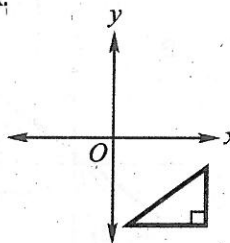
J.



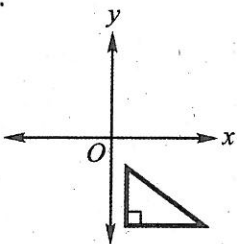
G.



K.



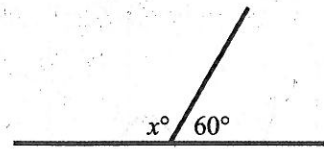
H.



Geometry Review and Strategies

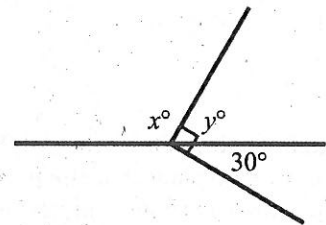
Lines and Angles

185. In the figure below, $x = ?$



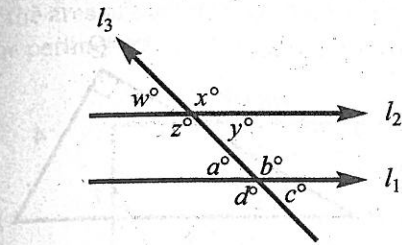
- A. 45
- B. 60
- C. 75
- D. 90
- E. 120

186. In the figure below, $x = ?$



- F. 45
- G. 60
- H. 90
- J. 105
- K. 120

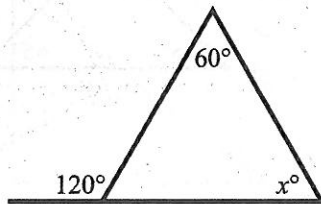
187. In the figure below, l_1 is parallel to l_2 . Which of the following must be true?



- I. $w = a$
- II. $y + b = 180$
- III. $x + d = 180$

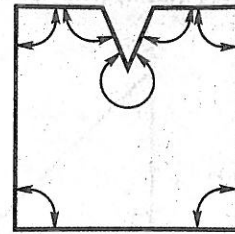
- A. I only
- B. II only
- C. I and II only
- D. II and III only
- E. I, II, and III

188. In the figure below, $x = ?$



- F. 30
- G. 45
- H. 60
- J. 75
- K. 90

189. In the figure below, what is the sum of the indicated angles?

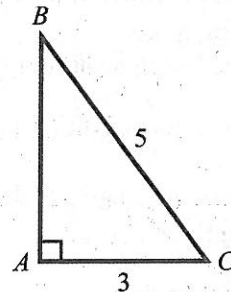


- A. 540
- B. 720
- C. 900
- D. 1,080
- E. 1,260

Triangles

Pythagorean Theorem

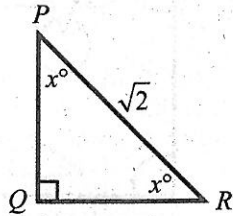
190. In the figure below, what is the length of \overline{AB} ?



- F. 2
- G. $2\sqrt{3}$
- H. 4
- J. $4\sqrt{2}$
- K. 8

45°-45°-90° Triangles

191. In the figure below, what is the length of \overline{PQ} ?



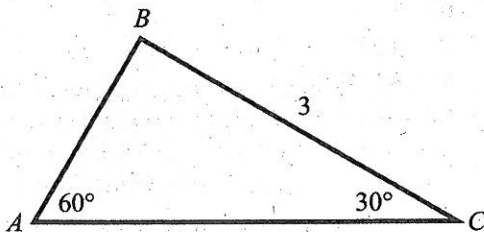
- A. 1
- B. $\sqrt{2}$
- C. $2\sqrt{2}$
- D. 4
- E. 5

192. In a right isosceles triangle, the hypotenuse is equal to which of the following?

- F. Half the length of either of the other sides
- G. The length of either of the other sides multiplied by $\sqrt{2}$
- H. Twice the length of either of the other sides
- J. The sum of the lengths of the other two sides
- K. The sum of the lengths of the other two sides multiplied by $\sqrt{2}$

30°-60°-90° Triangles

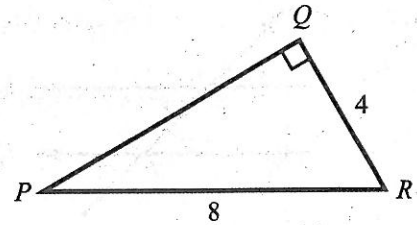
193. In the triangle below, what is the length of \overline{AC} ?



- A. 2
- B. $\sqrt{3}$
- C. $2\sqrt{3}$
- D. $3\sqrt{3}$
- E. 6

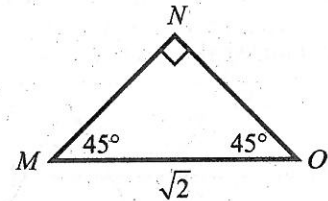
Working with Triangles

194. In the figure below, the perimeter of $\triangle PQR = ?$



- F. $12 + \sqrt{3}$
- G. $12 + 2\sqrt{3}$
- H. $12 + 4\sqrt{3}$
- J. 28
- K. 56

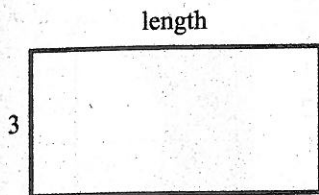
195. In the figure below, what is the area of $\triangle MNO$?



- A. $\frac{1}{2}$
- B. $\frac{\sqrt{2}}{2}$
- C. 1
- D. $\sqrt{2}$
- E. 2

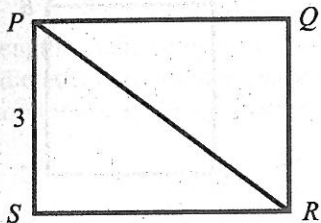
Rectangles and Squares

196. If the area of the rectangle below is 18, what is the perimeter?



- F. 9
- G. 12
- H. 18
- J. 24
- K. 30

197. In the figure below, $PQRS$ is a rectangle. If $\overline{PR} = 5$ centimeters, what is the area, in square centimeters, of the rectangle?



- A. 2
- B. 3
- C. 4
- D. 8
- E. 12

198. If the width of a rectangle is increased by 10% and the length of the rectangle is increased by 20%, by what percent does the area of the rectangle increase?

- F. 2%
- G. 10%
- H. 15%
- J. 32%
- K. 36%

Circles

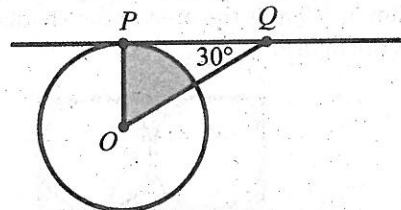
199. If the area of a circle is equal to 9π , which of the following is (are) true?

- I. The radius is 3.
- II. The diameter is 6.
- III. The circumference is 6π .

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

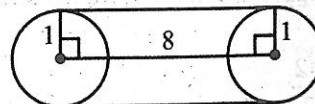
Properties of Tangent Lines

200. In the figure below, O is the center of the circle, and \overline{PQ} is tangent to the circle at P . If the radius of circle O has a length of 6, what is the area of the shaded portion of the figure?



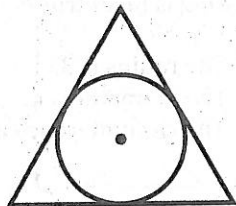
- F. π
- G. 3π
- H. 6π
- J. 9π
- K. 12π

201. The figure below shows two pulleys connected by a belt. If the centers of the pulleys are 8 feet apart and the pulleys each have a radius of 1 foot, what is the length, in feet, of the belt?



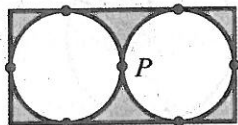
- A. 4π
- B. 8π
- C. $8 + \pi$
- D. $16 + \pi$
- E. $16 + 2\pi$

202. In the figure below, a circle is inscribed in an equilateral triangle. If the radius of the circle is 1, what is the perimeter of the triangle?



- F. $\sqrt{3}$
- G. $2\sqrt{3}$
- H. $3\sqrt{3}$
- J. 6
- K. $6\sqrt{3}$

203. The figure below shows two circles of diameter 2 that are tangent to each other at point P . The line segments form a rectangle and are tangent to the circles at the points shown. What is the area of the shaded portion of the figure?



- A. $8 - 2\pi$
- B. $8 - \pi$
- C. $4 - 2\pi$
- D. $4 - \pi$
- E. 2π

Complex Figures

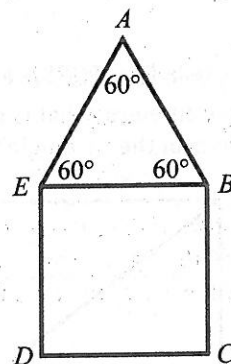
204. If a circle of radius 1 foot is inscribed in a square, what is the area, in square feet, of the square?

- F. $\frac{\sqrt{2}}{2}$
- G. 1
- H. $\sqrt{2}$
- J. 2
- K. 4

205. An isosceles right triangle is inscribed in a semicircle with a radius of 1 inch. What is the area, in square inches, of the triangle?

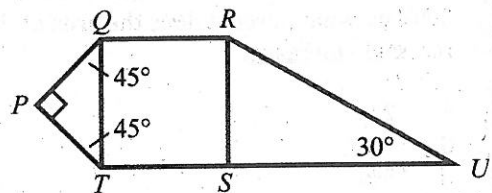
- A. $\frac{\sqrt{2}}{3}$
- B. $\frac{1}{2}$
- C. 1
- D. $\sqrt{2}$
- E. $2\sqrt{2}$

206. In the figure below, $BCDE$ is a square with an area of 4. What is the perimeter of $\triangle ABE$?



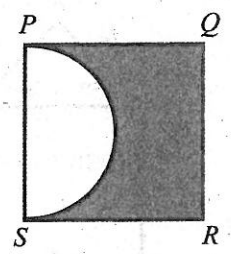
- F. 3
- G. 4
- H. 6
- J. 8
- K. 12

207. In the figure below, if $QRST$ is a square and the length of \overline{PQ} is $\sqrt{2}$, what is the length of \overline{RU} ?



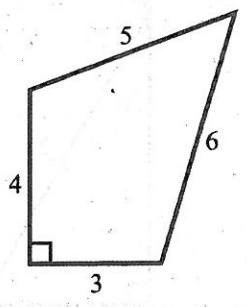
- A. $\sqrt{2}$
- B. $2\sqrt{2}$
- C. $\sqrt{6}$
- D. 4
- E. $4\sqrt{3}$

208. In the figure below, $PQRS$ is a square, and \overline{PS} is the diameter of a semicircle. If the length of \overline{PQ} is 2, what is the area of the shaded portion of the diagram?



- F. $4 - 2\pi$
- G. $4 - \pi$
- H. $4 - \frac{\pi}{2}$
- J. $8 - \pi$
- K. $8 - \frac{\pi}{2}$

209. If the lengths of the sides, in inches, are as marked on the figure below, what is the area, in square inches, of the quadrilateral?

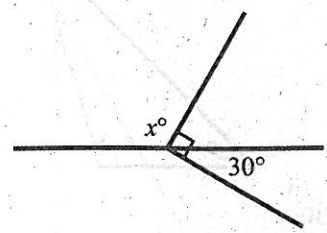


- A. 6
- B. $6 + \sqrt{3}$
- C. 12
- D. 18
- E. 24

Geometry Strategies

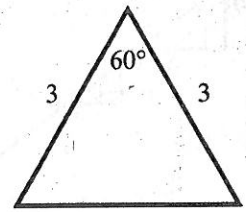
"Guesstimating"

210. In the figure below, $x = ?$



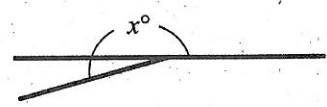
- F. 30
- G. 65
- H. 120
- J. 150
- K. 170

211. What is the perimeter of the triangle shown below?



- A. $3\sqrt{2}$
- B. 6
- C. 7.5
- D. 9
- E. 15

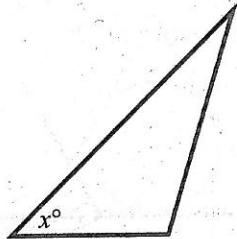
212. In the figure below, $x = ?$



- F. 120
- G. 150
- H. 180
- J. 210
- K. 240

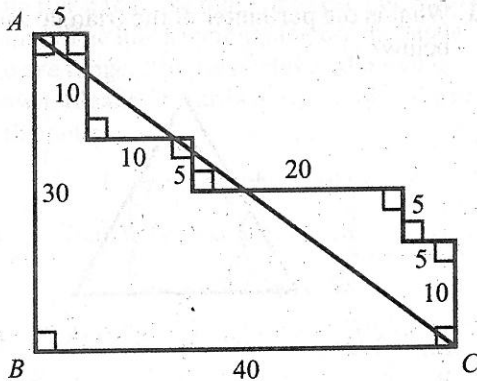
Measuring

213. In the figure below, $x = ?$



- A. 30
- B. 45
- C. 60
- D. 75
- E. 90

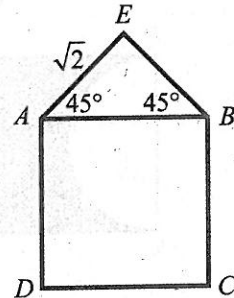
214. In the figure below, what is the length of \overline{AC} ?



- F. $30\sqrt{2}$
- G. 50
- H. 75
- J. $60\sqrt{2}$
- K. 100

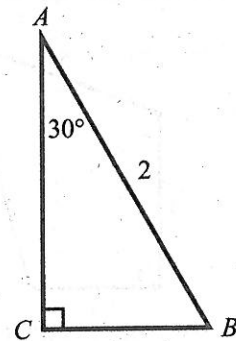
"Measuring"

215. In the figure below, what is the area of square $ABCD$?



- A. 2
- B. $2\sqrt{2}$
- C. 4
- D. $4\sqrt{2}$
- E. 8

216. In the triangle below, the measure of $\angle BAC$ is 30° and the length of \overline{AB} is 2. Which of the following best approximates the length of \overline{AC} ?

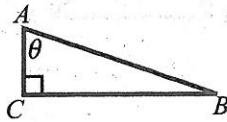


- F. 0.8
- G. 1.0
- H. 1.7
- J. 1.9
- K. 2.3

Trigonometry Review and Strategies

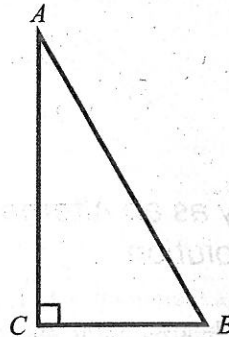
Definitions of the Six Trigonometric Functions

217. For the figure below, $\sin \theta = \frac{12}{13}$. Which of the following is INCORRECT?



- A. $\cos \theta = \frac{5}{13}$
- B. $\tan \theta = \frac{12}{5}$
- C. $\cot \theta = \frac{5}{12}$
- D. $\sec \theta = \frac{13}{5}$
- E. $\csc \theta = \frac{12}{13}$

218. In the right triangle below, the length of \overline{AB} is 5 centimeters and $\angle A$ measures 30° . What is the length, in centimeters, of \overline{BC} ? ($\sin 30^\circ = 0.5$)



- F. 4
- G. $3\frac{1}{2}$
- H. $2\frac{3}{4}$
- J. $2\frac{1}{2}$
- K. 2

Trigonometric Relationships

219. If $\sin 60^\circ$ is equal to $\frac{\sqrt{3}}{2}$, what is the value of $\sin^2 30^\circ + \cos^2 30^\circ$?

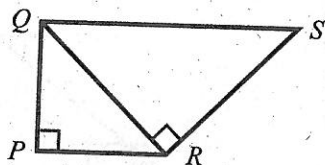
- A. $\frac{\sqrt{3}+1}{2}$
- B. $\sqrt{5}$
- C. $\frac{\sqrt{5}}{2}$
- D. $\frac{3}{4}$
- E. 1

220. Which of the following is equivalent to $\frac{\sin A}{\cos A}$?

- F. $\tan A$
- G. $\cot A$
- H. $\sec A$
- J. $\csc A$
- K. $\frac{1}{\tan A}$

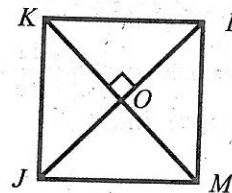
Trigonometry as an Alternative Method of Solution

221. In the figure below, $\triangle PQR$ and $\triangle QRS$ are isosceles right triangles. If $\overline{QP} = 3$, what is the length of \overline{QS} ? $\left(\sin 45^\circ = \frac{\sqrt{2}}{2}\right)$



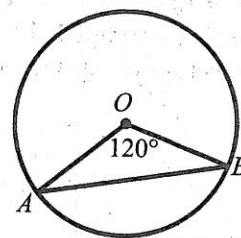
- A. $\sqrt{2}$
- B. $2\sqrt{2}$
- C. 4
- D. 6
- E. 8

222. If the area of the square $JKLM$ in the figure below is 4, what is the sum of the lengths of the diagonals \overline{JL} and \overline{KM} ? $\left(\sin 45^\circ = \frac{\sqrt{2}}{2}\right)$



- F. $\frac{\sqrt{2}}{2}$
- G. $2 + \frac{\sqrt{2}}{2}$
- H. $4\sqrt{2}$
- J. $4 + 4\sqrt{2}$
- K. $8\sqrt{2}$

223. In the figure below, O is the center of the circle with radius 10. What is the area of $\triangle AOB$? $\left(\sin 30^\circ = \frac{1}{2}; \sin 60^\circ = \frac{\sqrt{3}}{2}\right)$



- A. $10\sqrt{3}$
- B. 10
- C. 25
- D. $25\sqrt{3}$
- E. 50

Statistics and Probability Review and Strategies

Averages

224. If the average of 35, 38, 41, 43, and x is 37, what is x ?

- F. 28
- G. 30
- H. 31
- J. 34
- K. 36

225. The average weight of 6 packages is 50 pounds per package. Another package is added, making the average weight of the 7 packages 52 pounds per package. What is the weight, in pounds, of the additional package?

- A. 2
- B. 7
- C. 52
- D. 62
- E. 64

226. The average of 10 test scores is 80. If the high and low scores are dropped, the average is 81. What is the average of the high and low scores?

- F. 76
- G. 78
- H. 80
- J. 81
- K. 82

227. In Latin 101, the final exam grade is weighted two times as heavily as the mid-term grade. If Leo received a score of 84 on his final exam and 90 on his mid-term, what was his course average?

- A. 88
- B. 87.5
- C. 86.5
- D. 86
- E. 85

228. In a group of children, three children are 10 years old and two children are 5 years old. What is the average age, in years, of the children in the group?

- F. 6
- G. 6.5
- H. 7
- J. 7.5
- K. 8

Median

229. The number of employment applications received by All-Star Staffing each month during 2002 was as follows: 8, 3, 5, 3, 4, 3, 1, 0, 3, 4, 0, and 7. What was the median number of applications received per month in 2002?

- A. 3
- B. 4
- C. 5
- D. 6
- E. 7

Mode

230. William's monthly electric bills for last year were as follows: \$40, 38, 36, 38, 34, 34, 30, 32, 34, 37, 39, and 40. What is the mode of the bills?

- F. \$33
- G. \$34
- H. \$35
- J. \$36
- K. \$37

Probability

231. If set $A = \{1, 2, 3, 4, 5, 6\}$ and set $B = \{1, 2, 3, 4, 5, 6\}$, what is the probability that the sum of one number from set A and one number from set B will total 7?

- A. $\frac{1}{12}$
- B. $\frac{5}{36}$
- C. $\frac{1}{6}$
- D. $\frac{1}{5}$
- E. $\frac{1}{3}$

232. If a book is selected at random from the collection shown below, which of the following has the greatest probability of being selected?

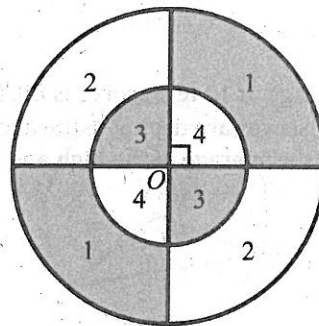
The Dark Night	History of Canada	RING MORE THAN ONCE	A Bright Morning	Chemistry	George Washington
Mary Smith	Carol Kim	Mary Smith	T. Jackson	Victor Brown	C. Adams
Mystery	Textbook	Mystery	Mystery	Textbook	Biography

- F. A book by Mary Smith
- G. A textbook
- H. A mystery
- J. A book written by either Carol Kim or Victor Brown
- K. A biography

233. If a jar contains r red marbles, b blue marbles, and g green marbles, which of the following expresses the probability that a marble drawn at random will NOT be red?

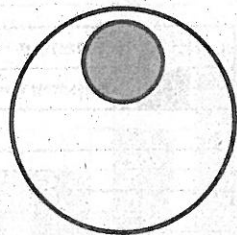
- A. $\frac{-r}{r+b+g}$
- B. $\frac{r}{r+b+g}$
- C. $\frac{b+g-r}{b+g+r}$
- D. $\frac{r}{b+g}$
- E. $\frac{b+g}{b+g+r}$

234. The figure below shows a dartboard consisting of two concentric circles with center O . The radius of the larger circle is equal to the diameter of the smaller circle. What is the probability that a randomly thrown dart striking the board will score a 3?



- F. $\frac{1}{16}$
- G. $\frac{1}{8}$
- H. $\frac{1}{4}$
- J. $\frac{1}{2}$
- K. $\frac{3}{4}$

235. An underwater salvage team is searching the ocean floor for a lost signal device using a large circular search pattern and a smaller circular search pattern with a radius equal to one-third that of the larger pattern. If the device is known to be inside the boundary of the larger search area, what is the probability that it is NOT located in the shaded portion of the figure?

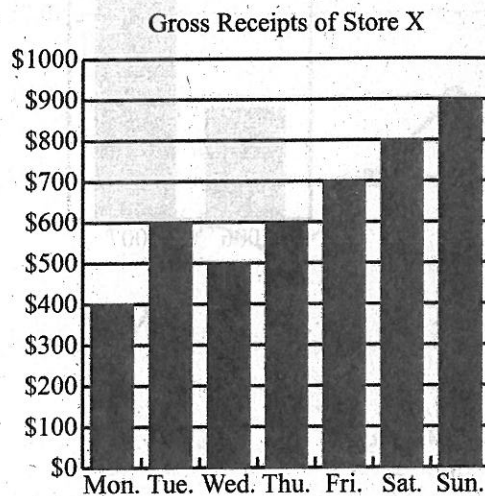


- A. $\frac{1}{9}$
- B. $\frac{1}{6}$
- C. $\frac{1}{3}$
- D. $\frac{1}{2}$
- E. $\frac{8}{9}$

Data Representation

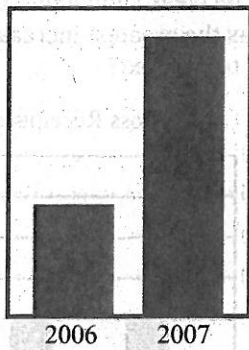
Bar, Cumulative, and Line Graphs

236. During the week shown in the graph below, what was the greatest increase in sales from one day to the next?



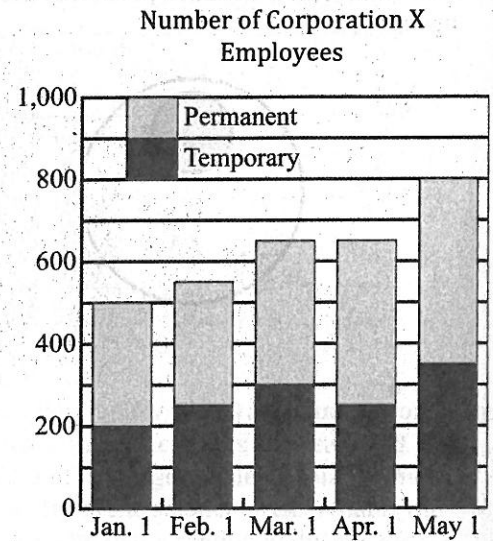
- F. \$50
- G. \$100
- H. \$150
- J. \$200
- K. \$250

237. If the graph below represents expenditures by Corporation X in two different years, what was the approximate ratio of expenditures in 2006 to those in 2007?



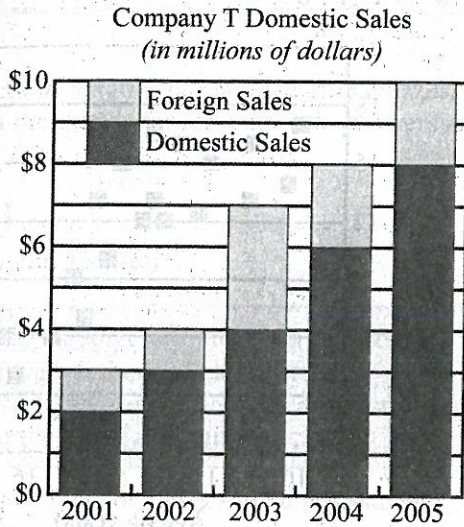
- A. $\frac{1}{5}$
- B. $\frac{2}{5}$
- C. $\frac{1}{2}$
- D. $\frac{2}{3}$
- E. 2

238. Based on the data presented below, what was the difference, if any, between the number of permanent workers employed by Corporation X on March 1st and the number of permanent workers employed by Corporation X on April 1st?



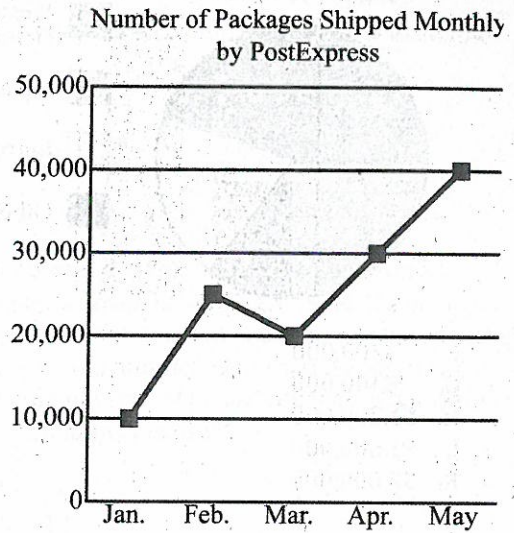
- F. 0
- G. 50
- H. 100
- J. 150
- K. 200

239. Based on the data presented below, what was the difference in the value of foreign sales by Company T between 2003 and 2005?



- A. \$1,000,000
- B. \$2,000,000
- C. \$3,000,000
- D. \$5,000,000
- E. \$6,000,000

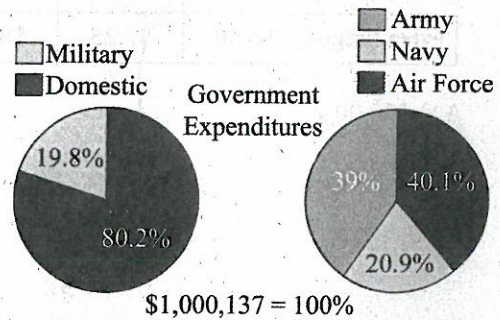
240. Based on the data presented below, what was the approximate total number of packages shipped by PostExpress for the months January, February, and March, inclusive?



- F. 40,000
- G. 55,000
- H. 60,000
- J. 70,000
- K. 85,000

Pie Charts

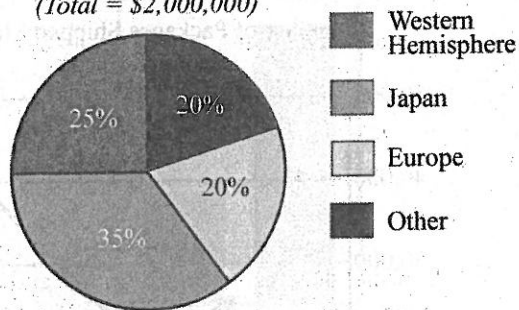
241. Based on the data presented below, approximately how much money was spent on the Air Force?



- A. \$39,704
- B. \$79,409
- C. \$96,123
- D. \$198,027
- E. \$401,054

242. Based on the data presented below, what was the dollar value of foreign sales to Europe by PetProducts in 2002?

PetProducts 2002 Foreign Sales
(Total = \$2,000,000)



- F. \$200,000
- G. \$400,000
- H. \$1,200,000
- J. \$1,600,000
- K. \$2,000,000

Tables (Matrices)

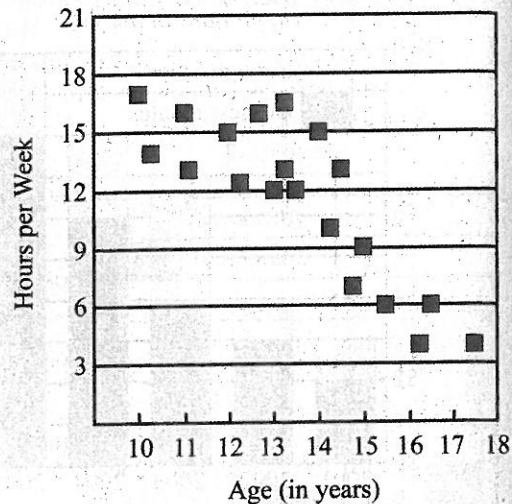
243. Based on the data presented below, what is the total cost of 5 large blue t-shirts, 8 small red t-shirts, and 4 extra large white t-shirts?

T-SHIRT PRICES			
	Blue	Red	White
Small	\$5.00	\$6.00	\$7.00
Large	\$5.75	\$6.50	\$7.25
Extra Large	\$6.50	\$7.25	\$8.00

- A. \$56.00
- B. \$88.25
- C. \$105.50
- D. \$108.75
- E. \$135.00

Scatterplots

244. The following scatterplot shows the video-game playing habits of 20 students.



The graph most strongly supports the conclusion that the number of hours per week spent playing video-games:

- F. is constant from age 10 to age 18.
- G. increases as age increases from 10 to 18.
- H. decreases as age increases from 10 to 18.
- J. is constant for ages 10 through 14 and then decreases.
- K. is constant for ages 10 through 14 and then increases.