# MATHS

# BOOKS - PRINCETON MATHS (ENGLISH)

# PRACTICE TEST 3

## Math Test No Calculator

**1.** Which of the following equations has a vertex of (3,-3)?

A. $y = 5(x-3)^2 - 3$

B. $y = 5(x+3)^2 - 3$

C. $y = 5(x-3)^2 + 3$

D. $y = 5(x+3)^2 + 3$

**Answer: A**

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**2.** A beverage store charges a base price of x dollars for one keg of root beer. A sales tax of a certain percentage is applied to to the base

price, and an untaxed deposit for the keg is added. If the total amount, in dollars , paid at the time of purchase for one keg is given by the expression 1.07x+17, then what is the sales tax, expressed as a percentage of the base price?

A. 0.0007

B. 0.0107

C. 0.07

D. 0.17

**Answer: C**

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**3.** Syed took out a cash advance of d dollars from a financing company. The company deducts a fee of $\frac{1}{3}$ of the original advanced amount long with a wire transfer fee of $30.00. Which of the following represents the final advanced amount that Syed receives after all applied fees, in dollars?

A. $\frac{1}{3}d - 30$

B. $\frac{1}{3}(d - 30)$

C. $\frac{2}{3}(d-30)$

D. $\frac{2}{3}d-30$

**Answer: D**

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**4.** What is the equation of a line that contains the point (1,6) and has a y-intercept of 4?

A. $y=\frac{1}{2}x+4$

B. $y=x+4$

C. $y = 2x + 4$

D. $y = 4x + 2$

**Answer: C**

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**5.** The number of bonus points, B(p), that a credit card holder receives is given by the function $B(p) = 4p + 7$, where p represents the number of purchases made. If the number

of purchases is increased by 3, by how much does the number of bonus points increase?

A. 3

B. 4

C. 12

D. 19

**Answer: C**

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**6.** Jeff tests how the total volume occupied by a fluid contained in a graduated cylinder changes when round marbles of various size are added. He found that the total volume occupied by the fluid, V, in cubic centimeters, can be found using the equation below, where x equals the number of identical marbles Jeff added,one at a time, to the cylinder , and r is the radius of one of the marbles .

$$V = 24\pi + x\left(\frac{4}{3}\pi r^3\right)$$

If the volume of the graduated cylinder is $96\pi$ cubic centimeters ,then , what is the maximum

number of marbles with a radius of 3 centimeters that Jeff can add without the volume of the fluid exceeding that of the graduated cylinder?

A. 1

B. 2

C. 3

D. 4

**Answer: B**

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**7.** IF b is two more than one-third of c, which of the following expresses the value of c in terms of b?

A. $c = \frac{b-2}{3}$

B. $c = \frac{b+3}{3}$

C. $c = 3(b-2)$

D. $c = 3(b-6)$

**Answer: C**

View Text Solution

**8.** The rotation rate of a mixing blade, in rotations per second, slows as a liquid is being added to the mixer. The blade rotates at 1,000 rotations per second when the mixer is empty. The rate at which the blade slows is four rotations per second less than three times the square of the height of the liquid. If h is the height of liquid in the mixer, which of the following represents R(h), the rate of rotation?

A. $4 - 9h^2$

B. $1,000 - (4 - 3h)$

C. $1,000 - (9h - 4)$

D. $1,000 - (3h^2 - 4)$

**Answer: D**

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**9.** A dental hygiene company is creating a new 24-ounce tube of toothpaste by combining its most popular toothpastes, Cavity Crusher and Bad Breadth Obliterator. Cavity Crusher

contains 0.25% of sodium fluoride as its active ingredient,and Bad Breath Obliterator contains 0.30 % of triclosan as its active ingredient for a total of 0.069 ounces of active ingredients in both toothpastes. Solving which of the following systems of equations yields the number of ounces of Cavity Crusher,c, and the number of ounces of Bad Breath Obliterator ,b, that are in the new toothpaste?

A. $c + b = 0.069$

$0.25c + 0.3b = 24$

B. $c + b = 24$

$0.0025c + 0.003b = 0.0069$

C. $c + b = 24$

$0.025c + 0.03b = 0.069$

D. $c + b = 24$

$0.25c + 0.3b = 0.069$

**Answer: B**

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10. $\frac{2d^2 - d - 10}{d^2 + 7d + 10} = \frac{d^2 - 4d + 3}{d^2 + 2d - 15}$

In the equation above, what is the value of d?

A. -4

B. 2

C. 4

D. 6

**Answer: C**

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**11.** Which of the following is a possible equation for a circle that is tangent to both the x-axis and the line x=4?

A. $(x+2)^2+(y+2)^2=4$

B. $(x+2)^2+(y-2)^2=4$

C. $(x-2)^2+(y+4)^2=4$

D. $(x-6)^2+(y-2)^2=4$

**Answer: D**

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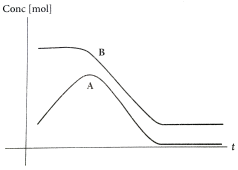
**12.** Reactant A is placed in a beaker, to which Reactant B will be added. Reactants A and B will not react unless B gets to a certain concentration. Once the reaction starts, both concentrations decreases until B has been consumed . Which of the following graphs showing concentration in moles as a function of time in seconds, represent the reaction?

A.

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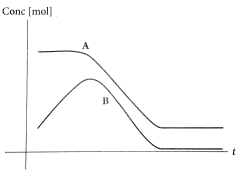
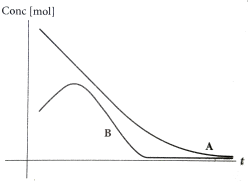
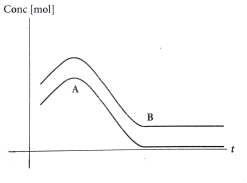


C. 


D. 


**Answer: B**

Watch Video Solution

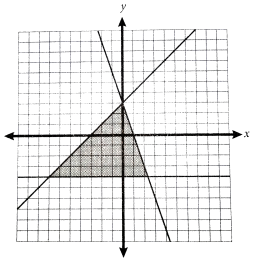
**13.** $-2y \leq 8$

$y - 3 \leq x$

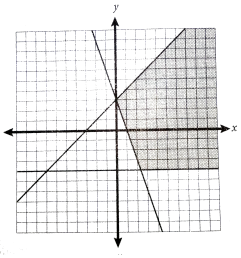
$-\frac{1}{3}y + 1 \geq x$

Which of the following graphs shows the solutions to the system of inequalities above?

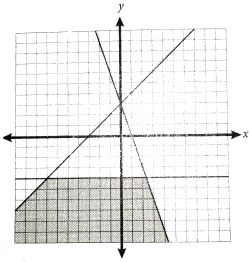
A.



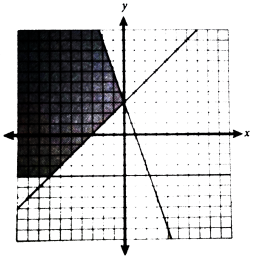

B.




C.




D.



**Answer: A**

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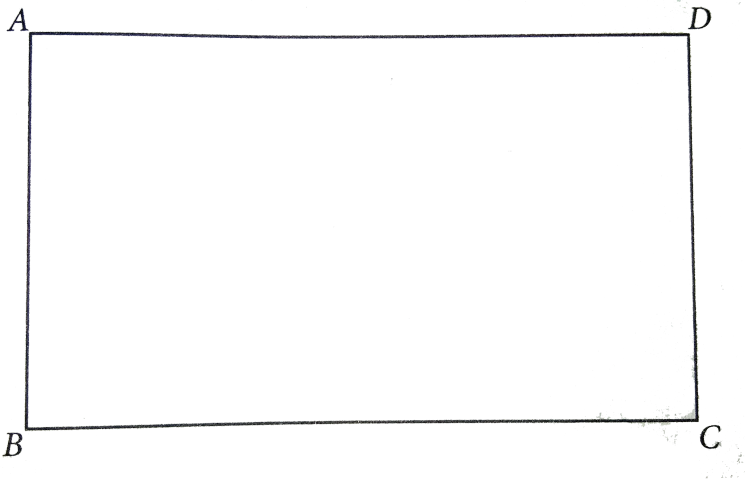
**14.**




In rectangle ABCD has an area of 48 and the tangent of $\angle BCA$ (not shown) is $\frac{3}{4}$, then

which of the following is the length of $\overline{BD}$ (not shown)?

A. 5

B. 10

C. 13

D. It cannot be determined from the given information

**Answer: B**

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**15.** Which of the following is equivalent to $\frac{2m+6}{4} \times \frac{6m-36}{3m+9}$?

A. $\frac{12m^2-216}{12m+36}$

B. $\frac{8m-30}{3m+13}$

C. $\frac{m-6}{4}$

D. m-6

**Answer: D**

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**16.** A rectangular box has sides 3,4 and x and a volume of 18. What is the value of x?

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**17.** Jeanne babysits chuy one day each week. Jeanne charges a $20 fee for the day, plus $5.50 for every 30 minutes of babysitting. How much has Jeanne earned after three hours of babysitting? (disregard the $ sign when gridding your answer)

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**18.** The parabola $y = -x^2 + 5x + 6$ is intersected by the line $y = -\frac{1}{2}x + 12$. What is the y-coordinate of the intersection closest to the x-axis?

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**19.** $13r + 8v = 47$

$22v = 63 - 17r$

Based on the system of equations above, what is the sum of r and v?

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**20.** A gardener has a cultivated plot that measures 4 feet by 6 feet. Next year, she wants to double the area of her plot by increasing the length and width by x feet. What is the value of x?

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Math Test Calculator

**1.** The population ,P, of town Y since 1995 can be estimated by the equation $P = 1.0635x + 3,250$, where x is the number of years since 1995 and $0 \leq x \leq 20$. In the context of this equation, what does the number 1.0635 most likely represent?

A. The estimated population of town Y in 1995

B. The estimated population of town Y in 2015

C. The factor by which the population of town Y increased yearly

D. The factor by which the population of town Y decreased yearly

**Answer: C**

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**2.** IF $x^2 + 12x = 64$ and $x > 0$, what is the value of x?

A. 2

B. 4

C. 8

D. 16

**Answer: B**

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**3.** Sai is ordering new shelving units for his store. Each unit is 7 feet in length and extends from floor to ceiling. The total length of the walls in Sai's store is 119 feet, which includes a length of 21 feet of windows along the walls . IF the shelving units cannot be placed in front of the windows, which of the following inequalities includes all possible values of r, the number of shelving units that Sai could use?

A. $r \leq \frac{119 - 21}{7}$

B. $r \geq \frac{119 + 21}{7}$

C. $r \leq 119 - 21 + 7r$

D. $r \geq 119 + 21 - 7r$

**Answer: A**

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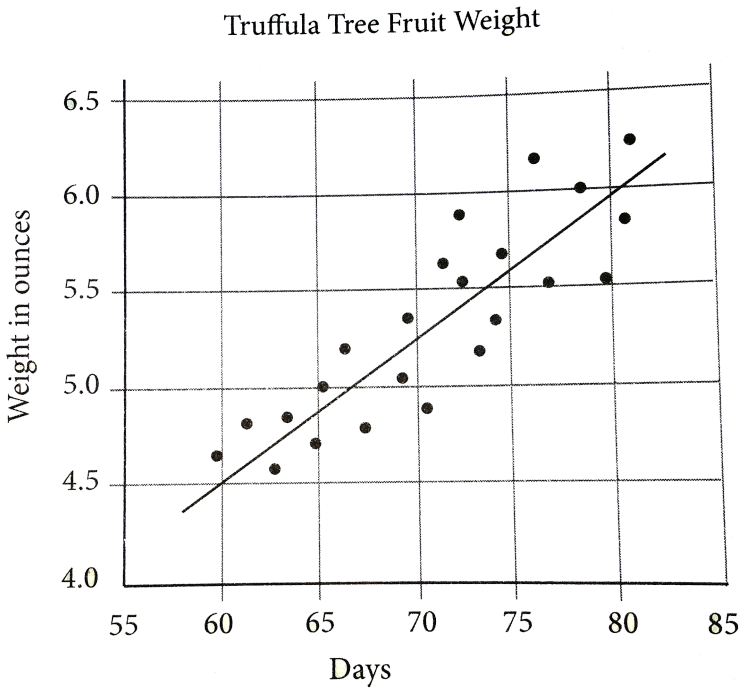


**4.**

The scatterplot above shows the weight, in ounces,of the fruits on a certain truffula tree from days 55 to 85 after flowering. According to the line of best fit in the scatterplot above, which of the following is the closest approximation of the number of days after

flowering of a truffula fruit that weighs 5.75 ounces?

A. 63

B. 65

C. 77

D. 81

**Answer: C**

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**5.** Hannah placed an online order for shirts that cost \$24.50 per shirt. A tax of 7% is added to the cost of the shirts, before a flat, untaxed shipping rate of \$6 is charged. Which of the following represents Hannah's total cost for s shirts, in dollars?

A. $0.07(24.50s + 6)$

B. $1.07(24.50 + 6)s$

C. $1.07(24.50s) + 6$

D. $1.07(24.50 + s) + 6$

**Answer: C**

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**6.** Once a certain plant begins begins to grow, its height increases at a linear rate. After six weeks, the plant is 54 centimeters tall. Which of the following functions best model the relationship between h(w) the heights in centimeters, of the plant, and w, the number of weeks that the plant has been growing?

A. h(w)=6w

B. h(w)=9w

C. h(w)=54w

D. h(w)=54+w

**Answer: B**

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**7.** Which of the following Is equivalent to $\left(12x^2+4x+5y\right)+\left(3x^2-2x+3y\right)$?

A. $2x^2 - 2x + 8y$

B. $2x^2 + 15x + 8y$

C. $15x^2 - 2x + 8y$

D. $15x^2 + 2x + 8y$

**Answer: D**

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**8.** An advertisement of Royal Rat Rations states:"7 out of 8 veterinarians recommend Royal rat rations for your fancy rat." No other

information about the data is provided by the company?

Based on the data , which of the following inferences is most valid?

A. Royal Rat Rations provides the best nutrition for fancy rats

B. If you do not feed your rat Royal Rat Rations, your rat will be unhealthy.

C. only one veterinarina does not recommend Royal Rat Rations for your fancy rat.

D. Of the veterinarians surveyed by Royal Rat Rations, the majority recommend Royal Rat Rations for your fancy rat.

**Answer: D**

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**9.** $\frac{1}{2}t + 4 = \frac{3}{4}t - 5$

In the equation above . What is the value of t?

A. 4

B. 9

C. 18

D. 36

**Answer: D**

View Text Solution

**10.** Dogs need 8.5 to 17 ounces of water each day for every 10 pounds of their weight. Everett has two dogs-Ringo is a 35-pound black lab mix,and Elvis is a 55-pound beagle.

Which of the following ranges represents the approximate total number of ounces of water,w, that Elvis and Ringo need in a week?

A. $77 \leq w \leq 153$

B. $109 \leq w \leq 218$

C. $536 \leq w \leq 1,071$

D. $765 \leq w \leq 1,530$

**Answer: C**

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**11.** Priya is planning to send her favorite dry rub recipe to a friend who lives in France. Before sending the recipe, Priya wants to convert the American customary units in the instructions into metric units so that her friend will easily be able to understand the measurements. IF the recipe calls for a ratio of four ounces of paprika to every seven ounces of chili powder, and if priya's friend is planning to make a large batch of dry rub with 91 total ounces of chili powder, approximately how

many total grams of paprika and chili powder will the recipe require? (1 ounce=28.3 grams)

A. 4,047grams

B. 4,521 grams

C. 4,925 grams

D. 5,149 grams

**Answer: A**

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**12.** Luciano measured the amount of water that evaporated over a period of time from a container holding w ounces of water, where w is greater than 12. By the end of the first day, the cub had lost 2 ounces of water. By the end of the 7th day, the cup had lost an additional 8 ounces of water. By the end of the 11th day, the cup had lost half of the water that remained after the 7th day. Which of the following represents the remaining amount of water, in ounces, in Luciano's container at the end of the 11th day?

A. $\frac{w-2}{8}$

B. $\frac{w-2}{2}-10$

C. $\frac{1}{2}w-10$

D. $\frac{w-10}{2}$

**Answer: D**

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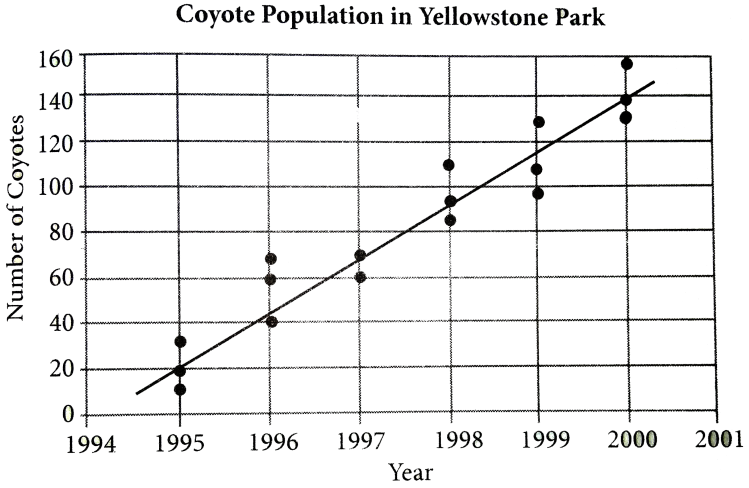
**13.** In the 1990s, the park rangers at Yellowstone National park implemented a program aimed at increasing the dwindling

coyote population in Montana. Results of studies of the coyote population in the park are shown in the scatterplot below.




Based on the line of best fit in the scatterplot above, which of the following is the closest to the average annual increase in coyotes in Yellowstone Park between 1995 and 2000?

A. 22

B. 24

C. 26

D. 28

**Answer: B**

View Text Solution

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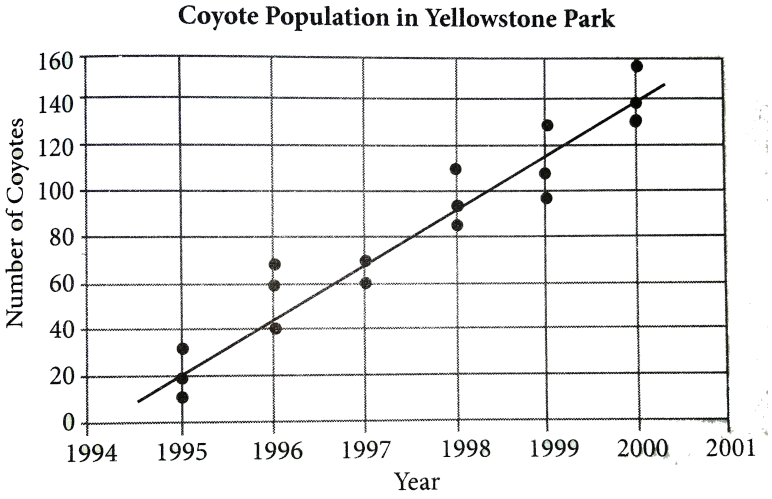


According to the data in the scatterplot, which of the following best represents the percent increase between the median of the results of the studies from 1995 and the median of the results of the studies from 1996?

A. 0.5

B. 1

C. 1.5

D. 2

**Answer: D**

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**15.** Bailey's Boutique Clothing is having a 20% off sale during which shirts cost $30.00 and pants cost $60.00. On the day of the sale,

Bailey's sells a total of 60 shirts and pants and earned a total of $2,250. On a regular day, Bailey's sells $\frac{2}{3}$ the number of shirts and pants sold during the sale and earns a total of $1,875. Solving which of the following system of equations yields the number of shirts,s, and the number of pants,p, sold during a regular day?

A. $s + p = 40$

$37.5s + 75p = 1,875$

B. $s + p = 40$

$30s + 60p = 2,250$

C. $s + p = 60$

$30s + 60p = 2,250$

D. $s + p = 2,250$

$30s + 60p = 60$

**Answer: A**

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**16.** Bryan, who works in a high-end jewelry store , earns a base pay of $10,00 per hour plus a certain percent commission on the sales that he helps to broker in the store. Bryan worked and average of 35 hours per week over the past two weeks and helped to broker sales of $5,000.00 worth of jewelry during that same two-week period. IF bryan's earnings for the two-week period were $850.00, what percent commission on sales does Bryan earn?

A. 0.01

B. 0.02

C. 0.03

D. 0.04

**Answer: C**

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**17.** IF $\frac{(C+x)}{x-3} = \frac{x+8}{3}$, Which of the following could be an expression of C in terms

of x?

A. 3(1+x)

B. $x^2 + 2x - 24$

C. $\frac{1}{3}(x + 6)(x - 4)$

D. $\frac{1}{3}(x - 3)(x + 8)$

**Answer: C**

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**18.** Lennon has 6 hours to spend in Ha Ha Tonka state park. He plants to drive around the park at an average speed of 20 miles per hour, looking for a good trail to hike. Once he finds a trail he likes, he will spend the remainder of his time hiking it. He hopes to travel more than 60 miles total while in the park. If he hikes at an average speed of 1.5 miles per hour, which of the following system of inequalities can be solved for the number of hours Lennon spends driving d, and the

number of hours he spends hiking,h, while he is at the park?

A. $1.5h + 20d > 60$

$h + d \leq 6$

B. $1.5h + 20d > 60$

$h + d \geq 6$

C. $1.5h + 20d < 60$

$h + d \geq 360$

D. $20h + 1.5d > 6$

$h + d \leq 60$

**Answer: A**

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**19.** In a certain sporting goods manufacturing company, a quality control expert tests a randomly selected group of 1,000 tennis balls in order to determine how many contain defects. IF this quality control expert discovered that 13 of the randomly selected tennis balls were defective, which of the

following inferences would be most supported?

A. 98.7% of the company's tennis balls are defective

B. 98.7% of the company's tennis balls are not defective

C. 9.87% of the company's tennis ball are defective

D. 9.87% of the company's tennis balls are not defective.

**Answer: B**

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**20.** IF $-\frac{20}{7} < -3z + 6 < -\frac{11}{5}$, what is the greatest possible integer value of 9z-18?

A. 6

B. 7

C. 8

D. 9

**Answer: C**

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**21.** $-24-8j=12k$

$3+\frac{5}{3}k=-\frac{7}{6}j$

Which of the following ordered pairs (j,k) is the solution to the system of equations above?

A. (6,-6)

B. (3,0)

C. (0,2)

D. (-4,1)

**Answer: A**

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**22.**

United States Investment in Alternative Energy Sources

| | Actual 2007 Investment | Projected 2017 Investment |
|---|---|---|
| Biofuels | 0.31 | 0.34 |
| Wind | 0.40 | 0.32 |
| Solar | 0.27 | 0.30 |
| Fuel Cells | 0.02 | 0.04 |
| Total | 1.00 | 1.00 |

The table above shows the relative investment

in alternative energy sources in the United States by type. One column shows the relative investment in 2007 of $75 million total invested in alternative energy. The other column shows the projected relative investment in alternative energy in 2017 is $254 million. Suppose that a new source of alternative energy, Cold Fusion,is perfected. It is projected that by 2017 that $57 million will be invested in Cold fusion in the United states, without any corresponding reduction in investment for any other form of alternative energy. What portion of the total investment

of alternative energy in the United states will be spent on biofuels?

A. 0.18

B. 0.22

C. 0.28

D. 0.34

**Answer: C**

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**23.** $(x-2)^2+y^2=36$

$y=-x+2$

The equation above represent a circle and a line that intersects the circle across its diameter . What is the point of intersection of the two equations that lies in Quadrant II?

A. $(-3\sqrt{2}, 3\sqrt{2})$

B. $(-4, 2)$

C. $(2+3, \sqrt{2})$

D. $(2-3\sqrt{2}, 3\sqrt{2})$

**Answer: D**

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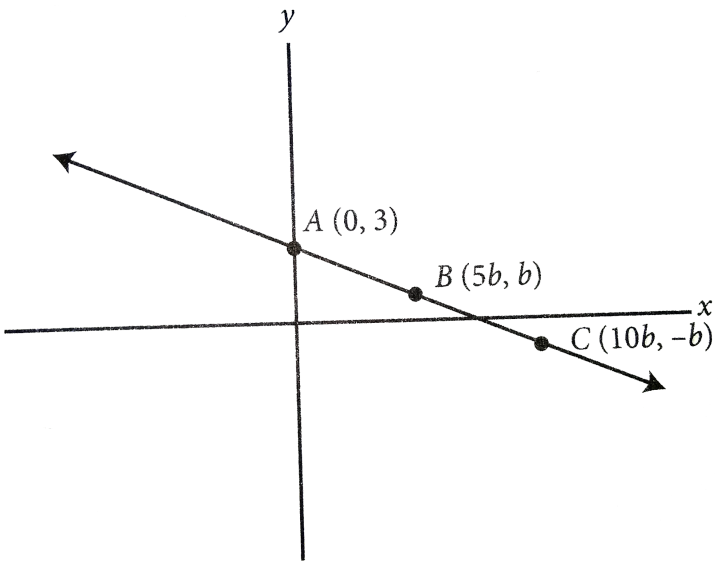


**24.**

The graph of f(x) is shown above in the xy-plane. The points (0,3) ,(5b,b) and (10b,-b) are

on the line described by f(x). If b is a positive constant, what are the coordinates of point C?

A. (5,1)

B. (10,-1)

C. (15,-0.5)

D. (20,-2)

**Answer: B**

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**25.** Melanie puts $1,100 in an investment account that she expects will make 5% interests for each three month period. However, after a year she realizes she was wrong about the interest rate and she has $50 less than she expected. Assuming the interest rate the account earns is constant, which of the following equations expresses the total money ,x, she will after t years using the actual rate?

A. $x = 1,100(1.04)^{4t}$

B. $x = 1,100(1.05)^{4t-50}$

C. $x = 1,100(1.04)^{t/3}$

D. $x = 1,100(1.035)^{4t}$

**Answer: A**

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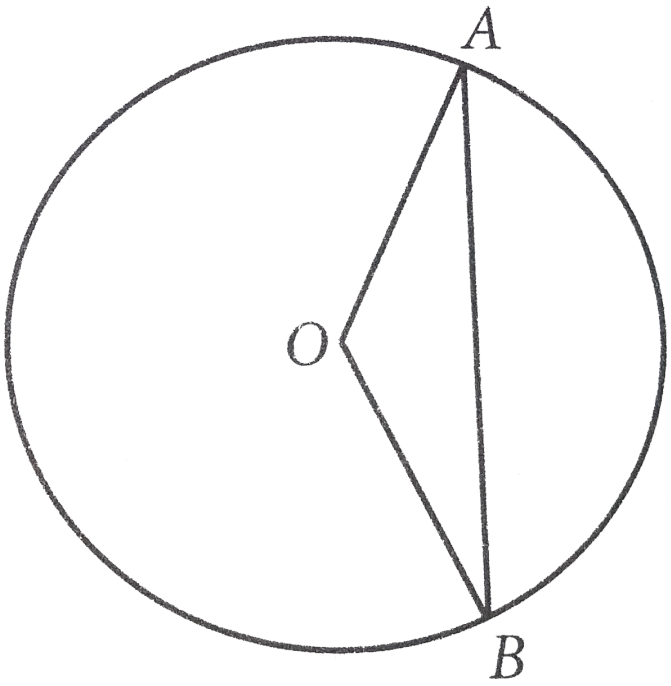


**26.**

If the radius of the circle above is x, $\angle AOB = 120^\circ$, and O is the center of the circle, what is the length of chord AB, in terms of x?

A. $\sqrt{2}x$

B. $\sqrt{3}x$

C. $\frac{x}{\sqrt{2}}$

D. $\frac{x}{\sqrt{3}}$

**Answer: B**

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**27.** Students in a physics class are studying how the angle at which a projectile is launched on level ground affects the projectile's hang time and horizontal range.

Hang time can be calculated using the formula $t = \frac{2v.\sin(\theta)}{g}$, where t is the hang time in seconds, v is the initial launch velocity, $\theta$ is the projectile angle with respect to level ground, and g is the acceleration due to gravity, defined as $9.8m/s^2$. Horizontal range can be calculated using the formula $R = \frac{v^2 \sin(2\theta)}{g}$, where R is the distance the projectile travels from the launch site, in feet. Which of the following gives the value on v, in terms of R, t and $\theta$?

A. $v = \frac{t\sin(\theta)}{2R\sin(\theta)}$

B. $v = \dfrac{2t\sin(\theta)}{R\sin(\theta)}$

C. $v = \dfrac{2R\sin(\theta)}{t\sin(2\theta)}$

D. $v = \dfrac{2R\sin(2\theta)}{t\sin(\theta)}$

**Answer: C**

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**28.** IF $\left(i^{413}\right)\left(i^{x}\right) = 1$ , then what is one possible value of x?

A. 0

B. 1

C. 2

D. 3

**Answer: D**

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**29.** The function g is defined by $g(x) = 2x^2 - dx - 6$, where d is a constant. If one of the zeros of g is 6, what is the value of the other zero of g?

A. 2

B. $\frac{1}{2}$

C. $-\frac{1}{2}$

D. -2

**Answer: C**

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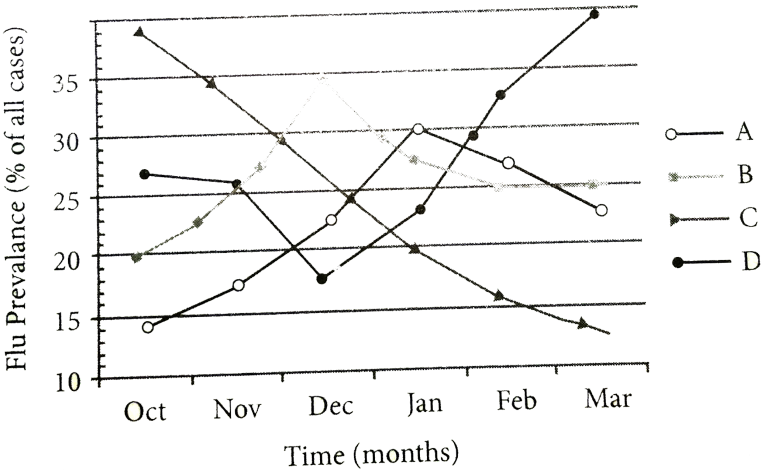
**30.** he flu shot for a flu seaons is created four strains of the flu virus, named Strain A,B,C and D, respectively. Medical researchers use the

following data to determine the effectiveness of the vacine over the flu season. Table 1 shows the effectiveness of the vaccine against each of these strains individually. The graph below the table shows the prevalence of each of these strains during each month of the flu season, represented as a percentage of the overall cases of flu that month.

Table 1

| Strain | Effectiveness |
|---|---|
| A | 35% |
| B | 13% |
| C | 76% |
| D | 68% |




For the strain against which the flu shot was the most effective. approximately how effective was the shot overall during the month that strain was least prevalent?

A. 0.13

B. 0.2

C. 0.27

D. 0.48

**Answer: D**

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**31.** IF $9 > 3y - 3$ , what is the greatest possible integer value of v?

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**32.** In the expression $\frac{\frac{6}{5}}{\frac{12}{2y}-\frac{5}{y}}=1$, What is the value of y?

A. $\frac{45}{6}$

B. 35/9

C. 45/9

D. 60/3

**Answer:** $\frac{45}{6}$ **OR .83**

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**33.** During a presidential election, a high school held its own mock election. Students had the option to vote for candidate A, Candidate B, or several other candidates. They could also choose to spoil their ballot. The table show displays a summary of the elections results.

| | Candidate A | Candidate B | Other | Total |
|---|---|---|---|---|
| $10^{th}$ grade | 0.32 | 0.58 | 0.10 | 1.00 |
| $11^{th}$ grade | 0.50 | 0.42 | 0.08 | 1.00 |
| $12^{th}$ grade | 0.63 | 0.32 | 0.05 | 1.00 |
| Total | 0.48 | 0.44 | 0.08 | 1.00 |

614 students voted for Candidate A. Approximately how many students attend the school?

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**34.** IF $\tan\theta = \frac{12}{5}$, then cos $\theta$=

A. 13/5

B. 12/13

C. 13/12

D. 5/13

**Answer:** $\frac{5}{13}$ **or .385**

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**35.** Marcellus is traveling abroad in Ghana and using travelers's checks, which he has acquired from Easy Traveler's Savings Bank. Easy Traveler's savings bank charges a 7% fee on traveler 's checks, which can then be used like cash at any location overseas at any location overseas at the same exchange rate. and any change will then be returned to Marcellus in

local currency. For this trip,Marcellus bought a 651 Cedi traveler's check and paid a fee of 32.30 USD (united States Dollars) for the check. WHile in Ghana, Marcellus finds Leon's Pawnshop and Barter, which offers store credit for Marcellus's briefcase equal to its value in Cedis. IF marcellus's briefcase in worth 5,000 USD at the same exchange rate at which he bought his traveler's check, then how much store credit,to the closest Cedi,will Marcellus receive for the briefcase?

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**36.** A square is inscribed in a circle. The area of the square is what percent of the area of the circle? (Disregard the percent symbol when gridding your answer).

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**37.** Professor Malingowski, a chemist and teacher at to communite college, is organizing his graduated cylinders in the hopes of keeping his office tidy and setting a good

example for his students. He has beakers with diameters, in inches, of $\frac{1}{2}$, $\frac{3}{4}$, $\frac{4}{5}$, $1$ and $\frac{5}{4}$. Professor Malingowski notices one additional cylinder lying on the ground, and can recall certain facts about it, but not its actual diameter. If he knows that the value of the additional graduated cylinder's diameter ,x, will not create any modes and will make the mean of the set equal to $\frac{5}{6}$, what is the value of the additional cylinder's diameter?

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**38.** Professor Malingowski, a chemist and teacher at to communite college, is organizing his graduated cylinders in the hopes of keeping his office tidy and setting a good example for his students. He has beakers with diameters, in inches, of $\frac{1}{2}$, $\frac{3}{4}$, $\frac{4}{5}$, $1$ and $\frac{5}{4}$. With his original five cylinders, Professor Malingowski realizes that he is missing a cylinder necessary for his upcoming lab demonstration for Thurday's class. He remembers that the cylinder the needs, when added to the original five, will create a median

diameter value of $\frac{9}{10}$ for the set of six total cylinders. He also knows that the measure of the sixth cylinder will exceed the value of the range of the current five cylinders by a width of anywhere from $\frac{1}{4}$ inches to $\frac{1}{2}$ inches, inclusive. Based on the above data, which is one possible value of y, the diameter of this missing sixth cylinder?

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