



Overview of The New SAT- Math

Solving Linear Equations

Solving Linear Equations- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h6-easier
<div>$3l - 6 \geq 8$<p>Which of the following best describes the solutions to the inequality shown above?</p><ul style="list-style-type: none"><input type="radio"/> $l \geq \frac{2}{3}$<input type="radio"/> $l \geq 2$<input type="radio"/> $l \geq \frac{14}{3}$<input type="radio"/> $l \geq 14$</div>	
Solving Linear Equations- Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h6-harder

$$3 + 10x - 5 = (a + 1) \cdot x - 2$$

In the equation shown above, a is a constant. For what value of a does the equation have infinitely many solutions?

- ☐ 2
- ☐ 7
- ☐ 10
- ☐ 9

Interpreting Linear Functions

Interpreting Linear Functions-Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h8-easier>

$$P = 3.53t + 100$$

The amount of money that farmers in Massachusetts paid to maintain their crops between 1991 and 2008 is modeled by the equation above, where P is the amount of money the farmers paid, in millions of dollars, and t is the year (assuming 1991 is $t = 0$). What does the 3.53 mean in the equation?

- ☐ The cost for maintaining crops was \$3.53 million in 1991.
- ☐ The cost for maintaining crops was \$3.53 million in 2008.
- ☐ The costs for maintaining crops increased a total of \$3.53 million between 1991 and 2008.
- ☐ The costs for maintaining crops increased by \$3.53 million each year between 1991 and 2008.

Interpreting Linear Functions-Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h8-harder>

$$g = 15 - \frac{m}{32}$$

Alice fills up the gas tank of her car before going for a long drive. The equation below models the amount of gas, g , in gallons, in Alice's car when she has driven m miles. What is the meaning of 32 in the equation?

- ☐ Alice uses 32 gallons of gas per mile.
- ☐ Alice's tank can hold 32 gallons of gas.
- ☐ Alice can drive 32 miles on a tank of gas.
- ☐ Alice's car can travel 32 miles to the gallon.

Linear Equation Word Functions

Linear Equation Word Functions- Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-linear-equation-easier>

Kaylee wants to do well in her classes, so she is budgeting her time carefully to decide the number of classes, c , she will take this year. For each class that she takes, she expects to spend $2\frac{1}{2}$ hours each week working on homework. She expects to spend an additional $6\frac{1}{2}$ hours each week completing the assigned reading for all of her classes together. If Kaylee has 19 hours available each week to complete homework and reading for her classes, which equation best models the situation?

- ☐ $2\frac{1}{2}c - 6\frac{1}{2} = 19$
- ☐ $2\frac{1}{2}c + 6\frac{1}{2} = 19$
- ☐ $6\frac{1}{2}c - 2\frac{1}{2} = 19$
- ☐ $6\frac{1}{2}c + 2\frac{1}{2} = 19$

Linear Equation Word Functions- Basic # 2

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h2-easier>

A convenience store requires that Ayumi spend \$4 or more if she wants to pay using a debit card. Donuts cost \$0.80 each. A bottle of orange juice costs \$1.20. If d represents the number of donuts Ayumi would need to buy to pay for 1 orange juice and the donuts using a debit card, which of the following inequalities best models the situation described above?

- ☐ $0.8(d + 1.2) > 4$
- ☐ $0.8(d + 1.2) \geq 4$
- ☐ $0.8d + 1.2 > 4$
- ☐ $0.8d + 1.2 \geq 4$

Linear Equation Word Functions- Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h2-harder>

Ngozi needs to send out 300 wedding invitations. In 1 minute, she can put 6 invitations into envelopes and apply stamps to them. It takes her a minimum of 50 seconds to address each invitation by hand. If n represents the number of invitations Ngozi can prepare for mailing in 180 minutes, which of the following inequalities best models the situation described above?

- ☐ $180 \geq \frac{n}{6} + \frac{5n}{6}$
- ☐ $180 > \frac{n}{6} + \frac{5n}{6}$
- ☐ $300 \leq 6n + \frac{6}{5}n$
- ☐ $300 < 6n + \frac{6}{5}n$

Linear Inequality Word Problems

Linear Inequality Word Problems- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-linear-equation-easier
<p>Kaylee wants to do well in her classes, so she is budgeting her time carefully to decide the number of classes, c, she will take this year. For each class that she takes, she expects to spend $2\frac{1}{2}$ hours each week working on homework. She expects to spend an additional $6\frac{1}{2}$ hours each week completing the assigned reading for all of her classes together. If Kaylee has 19 hours available each week to complete homework and reading for her classes, which equation best models the situation?</p> <ul style="list-style-type: none"> <input type="radio"/> $2\frac{1}{2}c - 6\frac{1}{2} = 19$ <input type="radio"/> $2\frac{1}{2}c + 6\frac{1}{2} = 19$ <input type="radio"/> $6\frac{1}{2}c - 2\frac{1}{2} = 19$ <input type="radio"/> $6\frac{1}{2}c + 2\frac{1}{2} = 19$ 	
Linear Inequality Word Problems- Basic #2	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h2-easier
<p>A convenience store requires that Ayumi spend <u>\$4 or more</u> if she wants to pay using a debit card. Donuts cost \$0.80 each. A bottle of orange juice costs \$1.20. If d represents the number of donuts Ayumi would need to buy to pay for 1 orange juice and the donuts using a debit card, which of the following inequalities best models the situation described above?</p> <ul style="list-style-type: none"> <input type="radio"/> $0.8(d + 1.2) > 4$ <input type="radio"/> $0.8(d + 1.2) \geq 4$ <input type="radio"/> $0.8d + 1.2 > 4$ <input type="radio"/> $0.8d + 1.2 \geq 4$ 	
Linear Inequality Word Problems- Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h2-harder

Ngozi needs to send out 300 wedding invitations. In 1 minute, she can put 6 invitations into envelopes and apply stamps to them. It takes her a minimum of 50 seconds to address each invitation by hand. If n represents the number of invitations Ngozi can prepare for mailing in 180 minutes, which of the following inequalities best models the situation described above?

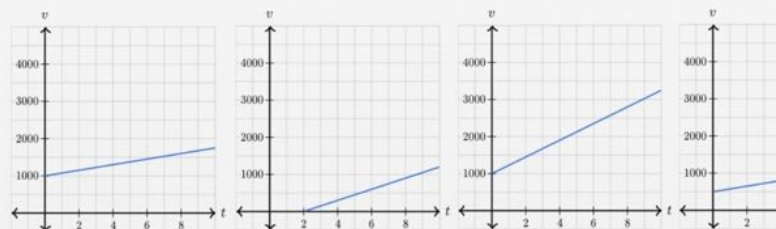
- ☐ $180 \geq \frac{n}{6} + \frac{5n}{6}$
- ☐ $180 > \frac{n}{6} + \frac{5n}{6}$
- ☐ $300 \leq 6n + \frac{6}{5}n$
- ☐ $300 < 6n + \frac{6}{5}n$

Graphing Linear Equations

Graphing Linear Equations-Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h9-easier>

The value of a bond on January 1st, 2014 is \$1,000. Each year the value of the bond increases linearly by \$75. Which graph below represents v , the dollar value of the bond, as a function of t , the number of years after January 1st, 2014?

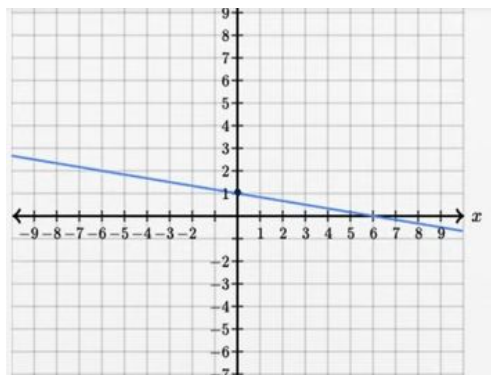


Graphing Linear Equations-Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h9-harder>

A line is graphed in the xy -plane as shown above. Which of the following equations represents the line?

- ☐ $x + 6y = 1$
- ☐ $x + 6y = 6$
- ☐ $x - 6y = 1$
- ☐ $x - 6y = -6$



Linear Function Word Problems

Linear Function Word Problems- Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h3-easier>

A college bookstore charges \$60 for a yearly membership. The first book is free with the membership, and any book after that costs \$7.60 including tax. How much money, m , does a student spend after buying b books and a yearly membership?

- ☐ $m = 7.60b$
- ☐ $m = 7.60(b - 1)$
- ☐ $m = 7.60b + 60$
- ☐ $m = 7.60(b - 1) + 60$

Linear Function Word Problems- Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h3-harder
<p>Minli's house is located <u>1.4</u> miles from her school. When she walks home from school, it takes her an average of <u>24</u> minutes. Assuming that Minli walks at a constant rate, which of the following functions best models Minli's distance from home, d, in miles, if she has walked a total of t minutes on her trip home that day?</p> <p> <input type="radio"/> $d = 1.4 - \frac{7}{120}t$ <input type="radio"/> $d = 1.4 - 24t$ <input type="radio"/> $d = 1.4 - \frac{120}{7}t$ <input type="radio"/> $d = 1.4 + \frac{7}{120}t$ </p>	

Systems of Linear Inequalities Word Problems

Systems of Linear Inequalities Word Problems-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h4-easier
<p>Karunesh is a gym owner who wants to offer a full schedule of yoga and circuit training classes. Yoga classes are each 1.5 hours long, while circuit training classes are only 1 hour, and he wants at least 25 hours of classes on the schedule each week. All of his instructors are paid \$35 per class, but Karunesh doesn't want to spend more than \$1,000 per week on salaries. Which of the following falls within Karunesh's guidelines for the weekly schedule?</p> <p> <input type="radio"/> 3 yoga classes and 19 circuit training classes <input type="radio"/> 10 yoga classes and 12 circuit training classes <input type="radio"/> 20 yoga classes and 12 circuit training classes <input type="radio"/> 25 yoga classes and 6 circuit training classes </p>	

Systems of Linear Inequalities Word Problems-Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h4-harder>

A cell phone producer distributes boxes of units to retail stores. A unit is either a cell phone or an accessory, and each box can have up to 24 units composed of c cellphones and a accessories. In addition, each box must have at least as many cell phones as accessories. Which of the following systems of inequalities best models the situation described above?

☐ $\begin{cases} 24 \leq a + c \\ a \leq c \end{cases}$

☐ $\begin{cases} 24 \leq a + c \\ c \leq a \end{cases}$

☐ $\begin{cases} a + c \leq 24 \\ a \leq c \end{cases}$

☐ $\begin{cases} a + c \leq 24 \\ c \leq a \end{cases}$

Solving Systems of Linear Equations

Solving Systems of Linear Equations-Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h7-easier>

$$\begin{aligned} y &= 3x \\ x &= 3y \end{aligned}$$

Consider the system of equations above. How many solutions does this system have?

☐ 0

☐ 1

☐ 2

☐ Infinitely many

Solving Systems of Linear Equations-Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h7-harder>

$$9x - 14y = -3$$

$$2x - ay = -6$$

Consider the system of linear equations above. Which of the following choices of a will result in a system of equations with no solutions?

- ☐ $-\frac{9}{14}$
- ☐ $-\frac{28}{9}$
- ☐ $\frac{9}{14}$
- ☐ $\frac{28}{9}$

Systems of Linear Equations Word Problems

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-heart-of-algebra/v/sat-math-h5-harder>

Tickets for a play were \$2 for each child and \$4 for each adult. At one showing of the play, one adult brought 4 children and the remaining adults brought 2 children each. The total ticket sales from the children and adults was \$60. How many children and adults attended the play?

- ☐ 12 children and 9 adults
- ☐ 14 children and 8 adults
- ☐ 16 children and 7 adults
- ☐ 18 children and 6 adults

Solving Quadratic Equations

Solving Quadratic Equations-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p5-easier
<div>$4x^2 = 52$<p>What are all the solutions to the equation above?</p><p><input type="radio"/> $x = 13$</p><p><input type="radio"/> $x = -13$ and $x = 13$</p><p><input type="radio"/> $x = \sqrt{13}$</p><p><input type="radio"/> $x = -\sqrt{13}$ and $x = \sqrt{13}$</p></div>	

Solving Quadratic Equations-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p5-harder
<div>$(x + 3)(x - 5) = 5$<p>What are all the solutions to the equation above?</p><p><input type="radio"/> $x = -3$ and $x = 5$</p><p><input type="radio"/> $x = 2$ and $x = 10$</p><p><input type="radio"/> $x = 1 - 2\sqrt{5}$ and $x = 1 + 2\sqrt{5}$</p><p><input type="radio"/> $x = 1 - \sqrt{21}$ and $x = 1 + \sqrt{21}$</p></div>	

Interpreting Nonlinear Expressions

Interpreting Nonlinear Expressions- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p10-easier
<div>$B = 70M^{0.75}$<p>Kleiber's law, above, relates the basal metabolic rate, B, measured in kilocalories per day, of an animal to its body mass, M, measured in kilograms. If the body mass of an elephant is 10^6 times that of a mouse, which of the following best compares their basal metabolic rates?</p><ul style="list-style-type: none"><input type="radio"/> The basal metabolic rate of the elephant is 0.75 times that of the mouse.<input type="radio"/> The basal metabolic rate of the mouse is $10^{4.5}$ times that of the elephant.<input type="radio"/> The basal metabolic rate of the elephant is $10^{4.5}$ times that of the mouse.<input type="radio"/> The basal metabolic rate of the elephant is 10^6 times that of the mouse.</div>	
Interpreting Nonlinear Expressions-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p10-harder
<div><p>The following equation shows Kepler's 3rd law of planetary motion. It relates the time, t (in days), that a planet takes to revolve once around our sun to the distance, d (in kilometers), of that planet from the sun.</p>$t^2 = 3.98 \cdot 10^{-20} \cdot d^3$<p>Mars is approximately 4 times as distant from the sun as Mercury is.</p><p>About how many times longer would Mars's revolution time be than for Mercury? Round your answer to the nearest whole number.</p></div>	

Quadratic and Exponential Word Problems

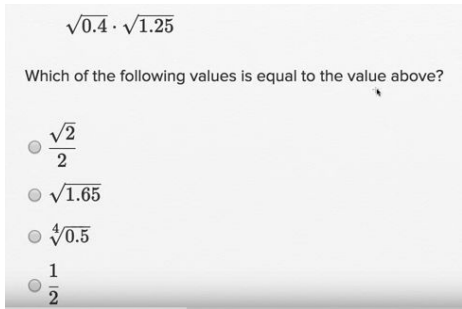
Quadratic and Exponential Word Problems-Basic	https://www.khanacademy.org/test-pre/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p1-easier
<p>A cable company with a reputation for poor customer service is losing subscribers at a rate of approximately 3% per year. The company had 2 million subscribers at the start of 2014.</p> <p>Assume that the company continues to lose subscribers at the same rate, and that there are no new subscribers. Which of the following functions, S, models the number of subscribers (in millions) remaining t years after the start of 2014?</p> <ul style="list-style-type: none"><input type="radio"/> $S(t) = 2(1.03)^t$<input type="radio"/> $S(t) = 2(0.97)^t$<input type="radio"/> $S(t) = 2(0.70)^t$<input type="radio"/> $S(t) = 2(0.97)t$	
Quadratic and Exponential Word Problems-Harder	https://www.khanacademy.org/test-pre/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p1-harder
<p>Currently, a local newspaper company sells print subscriptions for \$9.30 a month and has 2400 subscribers. Based on a survey conducted, they expect to lose 20 subscribers for each \$0.10 increase from the current monthly subscription price. What should the newspaper company charge for a monthly subscription in order to maximize the income from the print newspaper subscriptions?</p> <ul style="list-style-type: none"><input type="radio"/> \$1.35<input type="radio"/> \$9.30<input type="radio"/> \$10.65<input type="radio"/> \$22.80	

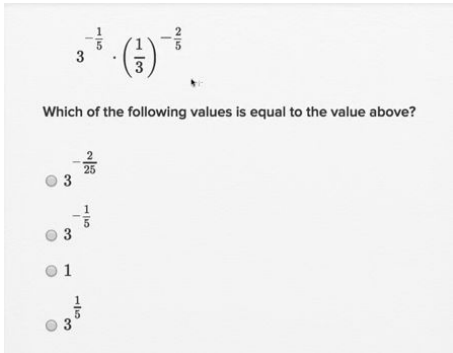
Manipulating Quadratic and Exponential Expressions

Manipulating Quadratic and Exponential Expressions- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p2-easier
<p>Miku plans to buy a new car, but she has learned that her car will lose value quickly in the first few years that she owns it. An online calculator uses the following formula to show her the value, $V(t)$, in dollars, of the car t years from now.</p> $V(t) = 24900 \cdot 0.85^t$ <p>How many times its present value would Miku's car be worth after any 2 year period?</p> <ul style="list-style-type: none"> <input type="radio"/> 0.7225 <input type="radio"/> 0.85 <input type="radio"/> 0.9219 <input type="radio"/> 1.7 	

Manipulating Quadratic and Exponential Expressions- Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p2-harder
<p>Dina purchased 200 feet of fencing to make a rectangular play area for her dogs. The possible area, A, is given by the equation below where w is the width of the play area.</p> $A(w) = 100w - w^2$ <p>Which of the following equivalent expressions displays, as a constant or coefficient, the value of the width for which the area is a maximum?</p> <ul style="list-style-type: none"> <input type="radio"/> $-(w - 50)^2 + 2500$ <input type="radio"/> $-(w + 20)^2 + 140w + 400$ <input type="radio"/> $-(w - 10)^2 + 80w + 100$ <input type="radio"/> $-(w + 10)^2 + 120w + 100$ 	

Radicals and Rational Exponents

Radicals and Rational Exponents-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p3-easier
	

Radicals and Rational Exponents-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p3-harder
	

Radical and Rational Equations

Radical and Rational Equations-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p7-easier
<div>$2 = \frac{11}{4k - 3}$<p>What is the solution to the equation above?</p><ul style="list-style-type: none"><input type="radio"/> $k = -\frac{17}{8}$<input type="radio"/> $k = -\frac{8}{17}$<input type="radio"/> $k = \frac{8}{17}$<input type="radio"/> $k = \frac{17}{8}$</div>	
Radical and Rational Equations-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p7-harder
<div>$3 + \sqrt{6m - 26} = m$<p>What is the sum of all the solutions to the above equation?</p></div>	

Operations with Rational Expressions

Operations with Rational Expressions- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p9-easier
<p>Which expression is equivalent to the following quotient for all $a > 0$, $b > 0$, and $c > 0$?</p> $\frac{\left(\frac{3a^3b^5}{c^3}\right)}{\left(\frac{15ab^2}{25c^4}\right)}$ <ul style="list-style-type: none"> <input type="radio"/> $\frac{9a^4b^7}{5c^7}$ <input type="radio"/> $\frac{9a^3b^{10}}{5c^{12}}$ <input type="radio"/> $\frac{a^2b^3}{5c}$ <input type="radio"/> $5a^2b^3c$ 	

Operations with Rational Expressions- Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p9-harder
$\frac{3}{x^2 + 5x - 24} - \frac{7}{x - 3}$ <p>Which expression is equivalent to the above difference?</p> <ul style="list-style-type: none"> <input type="radio"/> $\frac{-4}{x^2 + 4x - 27}$ <input type="radio"/> $\frac{-4}{x^2 + 4x - 21}$ <input type="radio"/> $\frac{-7x - 53}{x^2 + 5x - 24}$ <input type="radio"/> $\frac{-7x + 59}{x^2 + 5x - 24}$ 	


Operations with Polynomials

Operations with Polynomials- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p6-easier
<p>Which of the following expressions is equivalent to $7k$ minus the product of $k + 1$ and $2k + 2$?</p> <ul style="list-style-type: none"><input type="radio"/> $-2k^2 + 3k - 2$<input type="radio"/> $5k^2 + 3k - 2$<input type="radio"/> $6k^2 + 10k + 2$<input type="radio"/> $12k^2 + 10k + 2$	

Operations with Polynomials-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p6-harder
<p>Which of the following is equivalent to $\left(\frac{1}{88}y^{100} + 1\right) - \left(\frac{1}{44}y^{100} - \frac{1}{2}\right)$?</p> <ul style="list-style-type: none"><input type="radio"/> $-\frac{1}{88}y^{100} + \frac{1}{2}$<input type="radio"/> $-\frac{1}{88}y^{100} + \frac{3}{2}$<input type="radio"/> $\frac{1}{44}y^{100} + \frac{1}{2}$<input type="radio"/> $\frac{1}{44}y^{100} + \frac{3}{2}$	

Polynomial Factors and Graphs

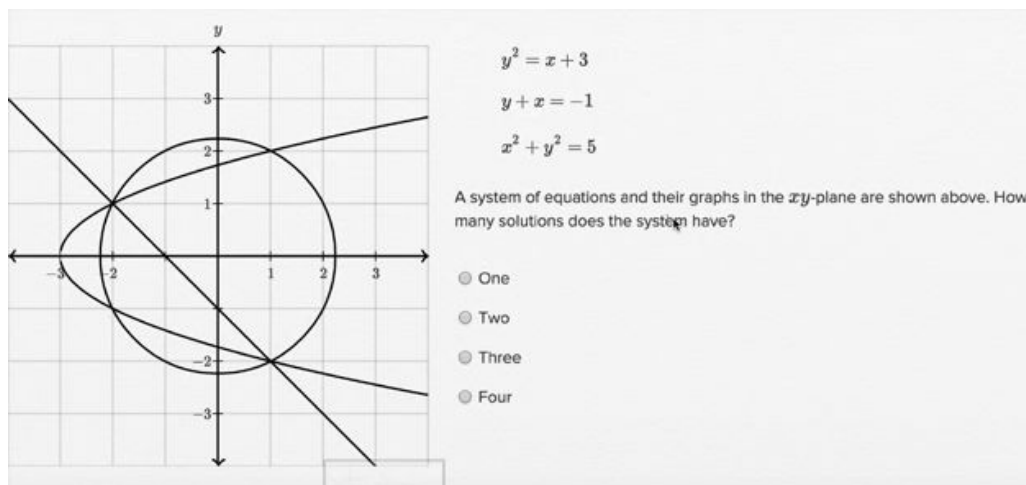
Polynomial Factors and Graphs-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p11-easier
<p> $P(x) = (x + 7)(x - 10)$ </p> <p>Given the polynomial above, what are its zeros?</p> <ul style="list-style-type: none"> <input type="radio"/> $x = -70$, $x = -3$, and $x = 1$ <input type="radio"/> $x = -1$, $x = 3$, and $x = 70$ <input type="radio"/> $x = -7$ and $x = 10$ <input type="radio"/> $x = -10$ and $x = 7$ 	

Polynomial Factors and Graphs-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p11-harder
<p>The polynomial $p(x)$ has 4 distinct zeros. Which of the following graphs could represent $y = p(x)$?</p> 	

Nonlinear Equation Graphs

Nonlinear Equation Graphs-Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p12-easier>



Nonlinear Equation Graphs-Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p12-harder>

The functions $y = 8 \left(\frac{3}{4}\right)^x$ and $y = \frac{1}{8} \cdot \left(\frac{7}{4}\right)^x$ are graphed in the xy -plane. Which of the following statements accurately describes whether each function is always increasing or decreasing?

- ☐ The graphs of both functions are always increasing.
- ☐ The graphs of both functions are always decreasing.
- ☐ The graph of $y = 8 \left(\frac{3}{4}\right)^x$ is always increasing, and the graph of $y = \frac{1}{8} \cdot \left(\frac{7}{4}\right)^x$ is always decreasing.
- ☐ The graph of $y = 8 \left(\frac{3}{4}\right)^x$ is always decreasing, and the graph of $y = \frac{1}{8} \cdot \left(\frac{7}{4}\right)^x$ is always increasing.

Linear and Quadratic Systems

Linear and Quadratic Systems-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p8-easier
<p>Which of the following represents all solutions (x, y) to the system of equations shown below</p> $2y + 6 = x$ $y^2 - 9 = x$ <ul style="list-style-type: none"><input type="radio"/> $(-5, 3)$<input type="radio"/> $(5, -3)$<input type="radio"/> $(16, 5)$ and $(0, -3)$<input type="radio"/> $(5, 16)$ and $(-3, 0)$	
Linear and Quadratic Systems-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p8-harder
<p>If (x, y) is a solution to the system of equations shown below, what is the product of the x-coordinates of the solutions?</p> $x^2 + x + 5 = y$ $2x + 7 = y$	

Structure in Expressions

Structure in Expressions- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p4-easier
<div>$(p + 1)^2 - 4$<p>Which of the following is equivalent to the above expression?</p><ul style="list-style-type: none"><input type="radio"/> $(p + 1 + 2)(p + 1 - 2)$<input type="radio"/> $(p - 1 + 2)(p - 1 - 2)$<input type="radio"/> $(p + 1 + 4)(p + 1 - 4)$<input type="radio"/> $(p - 1 + 4)(p - 1 - 4)$</div>	

Structure in Expressions- Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p4-harder
<div>$a^2 \left(\frac{1}{2x - y} \right)^2 - 1$<p>Which of the following is equivalent to the above expression?</p><ul style="list-style-type: none"><input type="radio"/> $\frac{a^2}{4x^2 - y^2} - 1$<input type="radio"/> $\left(\frac{a}{2x - y} - 1 \right)^2$<input type="radio"/> $\left(\frac{a^2}{2x - y} - 1 \right) \left(\frac{1}{2x - y} + 1 \right)$<input type="radio"/> $\left(\frac{a}{2x - y} - 1 \right) \left(\frac{a}{2x - y} + 1 \right)$</div>	

Isolating Quantities

Isolating Quantities- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p14-easier
<div style="border: 1px solid #ccc; padding: 10px; background-color: #f9f9f9;"> $P = P_o + \rho gh$ <p>The absolute pressure, P, in a fluid of density, ρ, at a given depth, h, can be found with the above equation, where P_o is atmospheric pressure and g is gravitational acceleration. Which of the following is the correct expression for the depth in terms of the absolute pressure, atmospheric pressure, fluid density, and gravitational acceleration?</p> <ul style="list-style-type: none"> <input type="radio"/> $h = \frac{P - P_o}{\rho g}$ <input type="radio"/> $h = \frac{P + P_o}{\rho g}$ <input type="radio"/> $h = \frac{P}{\rho g} - P_o$ <input type="radio"/> $h = \frac{P}{\rho g} + P_o$ </div>	

Isolating Quantities- Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p14-harder
<div style="border: 1px solid #ccc; padding: 10px; background-color: #f9f9f9;"> $A = P(1 + r)^t$ <p>If an initial investment, P, bears interest at a rate, r, and is compounded annually, its future value, A, after t years can be determined with the equation above. Which of the following equations shows the interest rate in terms of the future value, initial investment, and number of years invested?</p> <ul style="list-style-type: none"> <input type="radio"/> $r = \frac{\frac{A}{P} - 1}{t}$ <input type="radio"/> $r = \frac{A - P - 1}{t}$ <input type="radio"/> $r = \left(\frac{A}{P} - 1\right)^{\frac{1}{t}}$ <input type="radio"/> $r = \left(\frac{A}{P}\right)^{\frac{1}{t}} - 1$ </div>	

Function Notation

Function Notation-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p13-easier
<p>Let $g(x) = x^2 - 5$.</p> <p>If $f(g(x)) = \sqrt{x^2 + 4}$, which of the following describes $f(x)$?</p> <ul style="list-style-type: none"> <input type="radio"/> $f(x) = \sqrt{x + 1}$ <input type="radio"/> $f(x) = \sqrt{x + 9}$ <input type="radio"/> $f(x) = \sqrt{x^2 + 1}$ <input type="radio"/> $f(x) = \sqrt{x^2 + 9}$ 	

Function Notation- Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-passport-advanced-mathematics/v/sat-math-p13-harder
<p>Let $y(x) = \sqrt[3]{x^3 + 1}$. Which of the following is equivalent to $y(y(x))$?</p> <ul style="list-style-type: none"> <input type="radio"/> $\sqrt[3]{x^3 + 1}$ <input type="radio"/> $\sqrt[3]{x^3 + 1} + 1$ <input type="radio"/> $\sqrt[3]{x^3 + 2}$ <input type="radio"/> $\sqrt[3]{(x^3 + 1)^3 + 1}$ 	

Ratios,Rates, and Proportions

Ratios,Rates, and Proportions-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q1-easier
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7 pounds of plums make 8 rolls of fruit leather. If every batch of fruit leather requires the same amount of plums, how many pounds of plums are required to make 20 rolls of fruit leather?

- ☐ 0.875 pounds
- ☐ 2.5 pounds
- ☐ 17.5 pounds
- ☐ 23 pounds

Ratios, Rates, and Proportions-Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q1-harder>

Erika plans to purchase seed to plant grass in a large field. She has a map of the region, and calculates the area of the region on paper to be 180 cm^2 . The scale on the map shows that $1 \text{ cm} = 20 \text{ ft}$. If Erika plans to cover every 400 ft^2 with one pound of seed, approximately how many pounds of seed will she need to cover the entire field?

- ☐ 9 pounds
- ☐ 18 pounds
- ☐ 90 pounds
- ☐ 180 pounds

Percents

Percents- Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q2-easier>

A pair of jeans that regularly costs \$40 is on sale for 30% off. As part of a promotion, each customer will also receive an additional discount on the marked sale price at the cash register. If the final price of the jeans was \$22.40, what additional discount was applied to the marked sale price?

- ☐ 12% off
- ☐ 20% off
- ☐ 44% off
- ☐ 56% off

Percents- Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q2-harder>

Today Ebuka opened a new cereal box. He ate a bowl of the cereal, which was 8% of the cereal in the entire box. If Ebuka continues to eat this much cereal in each bowl, approximately how many more bowls of cereal can he expect to get from this box?

- ☐ 7 bowls
- ☐ 8 bowls
- ☐ 11.5 bowls
- ☐ 12.5 bowls

Units

Units-Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q3-easier>

A high school class is measuring the amount of nitrate in a local stream. To be considered safe to drink, the maximum amount of nitrate that can be present in water is 10 milligrams per liter. The class takes a sample of 15 liters (L) of water. If the number of milligrams per liter of nitrate in the stream water is $\frac{3}{4}$ of the maximum that is safe to drink, how many milligrams (mg) of nitrate should the class expect to find in their sample?

- ☐ 112.5 mg
- ☐ 150.0 mg
- ☐ 200.0 mg
- ☐ 225.0 mg

Units- Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q3-harder>

In order to connect to the internet, dedicated computers are kept in a server room. To prevent overheating, the density of computers in a server room must not exceed 2.1 computers per cubic foot. (1 meter is about 3.28 feet.) Which of the following densities is equal to the maximum number of computers per cubic meter?

- ☐ 0.06 computers per cubic meter
- ☐ 0.64 computers per cubic meter
- ☐ 6.89 computers per cubic meter
- ☐ 74.10 computers per cubic meter

Table Data

Table Data- Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q3-harder>

Music preference	Male	Female	Total
Rock and roll	8	8	16
Pop	14	13	27
Classical	5	8	13
Rap	4	6	10
Country and western	2	2	4
Rhythm and blues	2	0	2
Total	35	37	72

A total of 72 people participated in a survey about their music preferences. The results, separated by gender, are displayed above. According to the survey, what is the probability that a male likes rap music?

Table Data- Harder

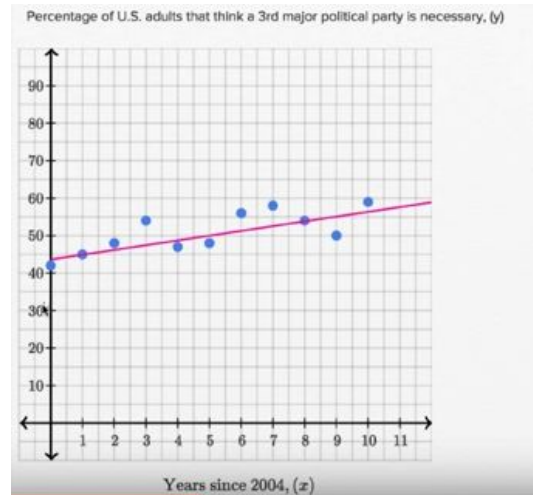
Dominant color	Large	Small	Total
Red	—	4	—
Blue	5	—	—
Total	—	—	24

Margo classified her favorite paintings hanging in a museum by both size and dominant color. The results are in the table above. Margo found that $\frac{1}{4}$ of her favorite large paintings were blue. How many of Margo's favorite paintings have red as the dominant color?

Scatterplots

Scatterplots-Basic

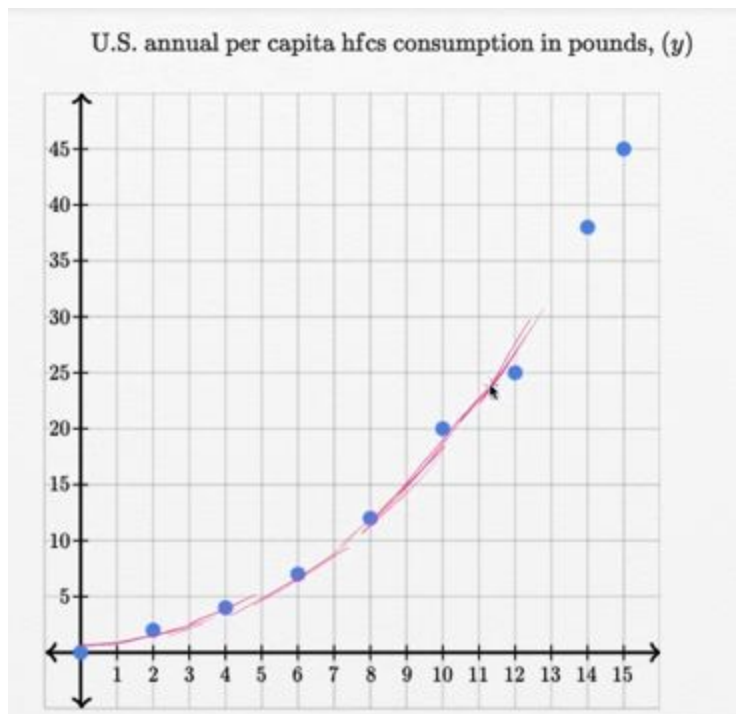
<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q4-easier>



Each year, a group of statisticians poll 1,500 randomly selected United States (U.S.) adults with the question: "Are the Democratic and Republican parties doing an adequate job, or is a third major political party needed?"

The scatter plot above shows the percentage of U.S. adults polled between the years 2004 and 2014 that think a third major political party is needed. Based on the line of best fit to the data shown, which of the following values is closest to the average yearly change in the percentage of people that think a third major political party is necessary?

- ☐ 1.30 percent
- ☐ 0.70 percent
- ☐ -0.70 percent
- ☐ -1.30 percent



The scatter plot drawn above depicts the average annual United States per capita consumption of high fructose corn syrup (hfcs) between the years 1970 and 1985. Which of the following functions best describes the relationship shown?

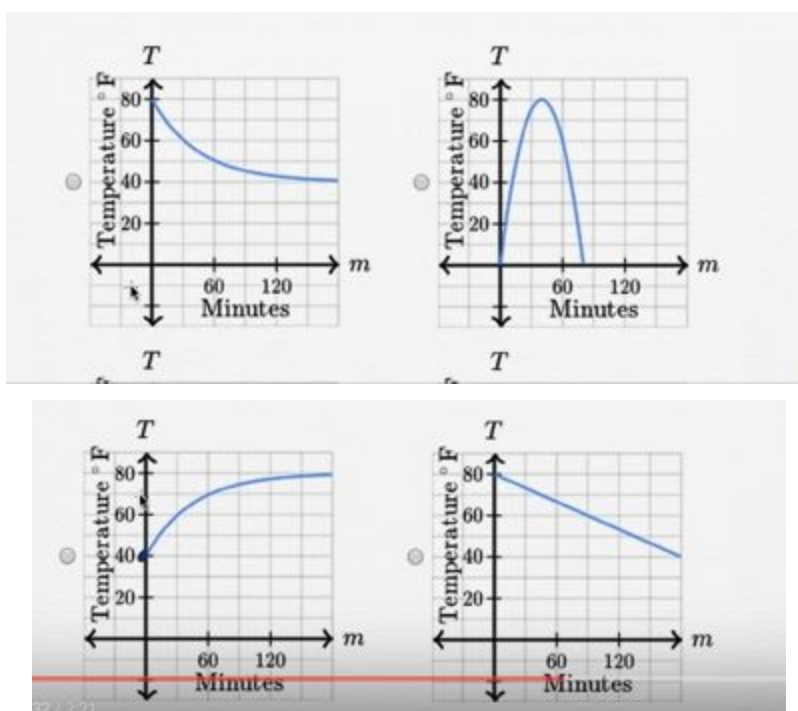
- ☐ $y = 0.201x^2 - 0.264x + 0.969$
- ☐ $y = -0.201x^2 - 0.264x + 0.969$
- ☐ $y = 201.00x^2 - 264.00x + 969.00$
- ☐ $y = -201.00x^2 - 264.00x + 969.00$

Key Features of Graphs

Key Features of Graphs- Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q5-easier>

Ruby puts a dish of macaroni and cheese into the refrigerator. The dish was 80°F when she put it in, and the inside of the refrigerator was 40°F . The dish cooled quickly at first, then slowed as it approached the temperature inside the refrigerator. Which of the following graphs in the mT -plane could best represent the temperature, T , in degrees Fahrenheit, m minutes after Ruby put the dish in the refrigerator?



Linear and Exponential Growth

Linear and Exponential Growth-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q6-easier
<p>The following equation represents the population growth of bacteria in a petri dish: $P(t) = 350(2)^t$, where $P(t)$ is the population after some amount of time, t, measured in hours. Which of the following best describes the relationship between the population of bacteria, $P(t)$, and the number of hours that have passed, t?</p> <ul style="list-style-type: none"><input type="radio"/> The relationship is linear since the population has 350 more bacteria than the previous hour.<input type="radio"/> The relationship is linear since the population has 2 more bacteria than the previous hour.<input type="radio"/> The relationship is exponential since the population is 350 times larger than the previous hour.<input type="radio"/> The relationship is exponential since the population is 2 times larger than the previous hour.	
Linear and Exponential Growth-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q6-harder
<p>From 1925 to 2014, the United States corn yield, measured in bushels per acre (bu/A), grew by approximately 2.41% per year. By contrast, during the same time period, soybean yield grew by approximately 3.5 bushels per acre (bu/A) every 10 years. A NASS survey showed that in 1959, the corn yield was 51.2 bu/A and the soybean yield was 23.5 bu/A. Based on the information above, which of the following is the best estimate for the difference between corn yield and soybean yield in 1974?</p> <ul style="list-style-type: none"><input type="radio"/> 28 bu/A<input type="radio"/> 44 bu/A<input type="radio"/> 49 bu/A<input type="radio"/> 73 bu/A	

Data Inferences

Data Inferences- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q8-easier
<p>In a survey of a random sample of 1,500 residents aged 25 years or older from a particular county, 399 residents had a bachelor's degree or higher. If the entire county had 635,000 residents aged 25 years or older, approximately how many county residents could be expected to have a bachelor's degree or higher?</p> <ul style="list-style-type: none"><input type="radio"/> 9,500 residents<input type="radio"/> 39,000 residents<input type="radio"/> 127,000 residents<input type="radio"/> 169,000 residents	
Data Inferences- Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q8-harder
<p>A researcher collecting information about 1,000 randomly selected physical therapists concluded that the median hourly wage for physical therapists in the United States at the time of the study was between \$22.76 and \$59.24, with a 95% confidence level. Which of the following could represent the median hourly wage, based on the same sample, for physical therapists in the United States with a 90% confidence level?</p> <ul style="list-style-type: none"><input type="radio"/> \$17.10 to \$64.90<input type="radio"/> \$20.48 to \$53.32<input type="radio"/> \$21.56 to \$56.12<input type="radio"/> \$25.65 to \$56.35	

Center, Spread and Shape of Distributions

Center, Spread and Shape of Distributions-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q9-easier						
<p>Mr. Jadav raised all of his students' scores on a recent exam by 10 points. What effect did this have on the mean and median of the scores?</p> <p><input type="radio"/> The mean increased by 10 points, but the median remained the same.</p> <p><input type="radio"/> The median increased by 10 points, but the mean remained the same.</p> <p><input type="radio"/> The mean increased by 10 points, and the median increased by 10 points.</p> <p><input type="radio"/> The mean and the median remained the same.</p>							
Center, Spread and Shape of Distributions-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q9-harder						
<table><tr><th>Cord length</th></tr><tr><td>8 feet</td></tr><tr><td>11 feet</td></tr><tr><td>6 feet</td></tr><tr><td>7 feet</td></tr><tr><td>x feet</td></tr></table> <p>A store has five different lengths of extension cords for sale as shown in the table above. If the range of lengths of the five cords is 7 feet, what is the greatest possible value of x?</p>		Cord length	8 feet	11 feet	6 feet	7 feet	x feet
Cord length							
8 feet							
11 feet							
6 feet							
7 feet							
x feet							

Data Collection and Conclusions

Data Collection and Conclusions- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-d-ata-analysis/v/sat-math-q10-easier
<p>The global temperature anomaly indicates how much warmer or colder the average global temperature is than normal during a particular time. A researcher conducting an observational study charted and analyzed atmospheric carbon dioxide (CO_2) levels and the global temperature anomaly in degrees celsius since the year 1960.</p> <p>The researcher observed that the rate of increase of atmospheric CO_2 since 1960 (approximately 4.0% per decade) is comparable to the rate of increase in the global temperature anomaly during the same time period (approximately 3.9% per decade). Based on this data, which conclusion is valid?</p> <ul style="list-style-type: none">There is a <u>correlation</u> between the increase in atmospheric CO_2 levels since 1960 and the increase in the global temperature anomaly during the same time period.The increase in the global temperature anomaly since 1960 caused the increase in atmospheric CO_2 levels during the same time period.The increase in atmospheric CO_2 levels since 1960 caused the increase in the global temperature anomaly during the same time period.There is no correlation between the increase in atmospheric CO_2 levels since 1960 and the increase in the global temperature anomaly during the same time period.	

Data Collection and Conclusions- Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-problem-solving-data-analysis/v/sat-math-q10-harder>

Player number	Date of birth	
9	January 4, 1988	
16	January 10, 1987	
17	January 15, 1988	
14	January 21, 1987	
5	January 22, 1988	
11	February 14, 1988	
3	March 1, 1987	
12	March 20, 1989	
10	May 2, 1987	
18	August 7, 1987	
15	December 20, 1987	

The table above shows the results of a 2007 observational study that looked at the birthdays of the players on the amateur Canadian youth hockey championship team. Based on the results of this study, which of the following conclusions are valid?

I : There is an association between players being on the 2007 amateur Canadian youth hockey championship team and being born between January 1 and June 30 in their year of birth.

II : There is no association between players being on the 2007 amateur Canadian youth hockey championship team and being born between January 1 and June 30 in their year of birth.

III : Canadian hockey players born in 1987 are more likely to become professional hockey players than Canadian hockey players born in 1989.

IV : More players on the 2007 amateur Canadian youth hockey championship team were born in 1987 than any other year.

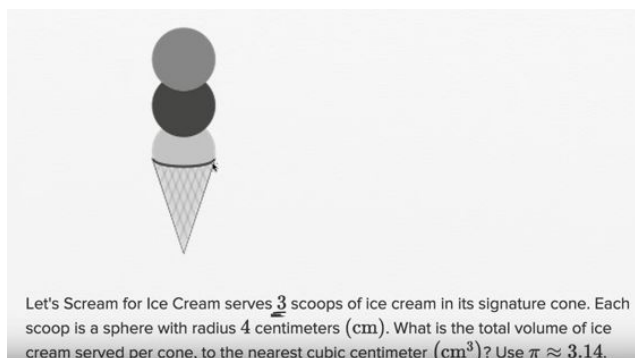
☐ I only
☐ II only
☐ I and IV
☒ I, III, and IV

Additional Math Topics

Volume Word Problems

Volume Word Problems- Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s1-easier>



Volume Word Problems- Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s1-harder>

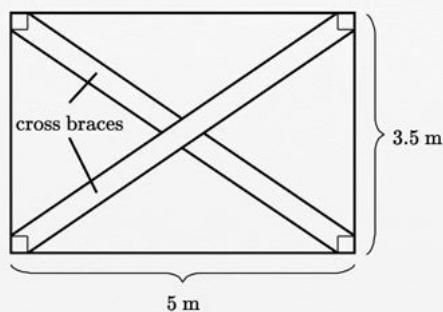
A tea infuser in the shape of a right rectangular pyramid is 7.9 centimeters (cm) tall, and has a base 3.0 cm long and 1.5 cm wide. To make the best tea, the infuser should be 80 percent filled with tea. What is the volume of tea, in cubic centimeters (cm^3), needed to fill the infuser to 80 percent of its capacity? Round to the nearest tenth.

- ☐ 4.7 cm^3
- ☐ 9.5 cm^3
- ☐ 11.9 cm^3
- ☐ 28.4 cm^3

Right Triangle Word Problems

Right Triangle Word Problems- Basic

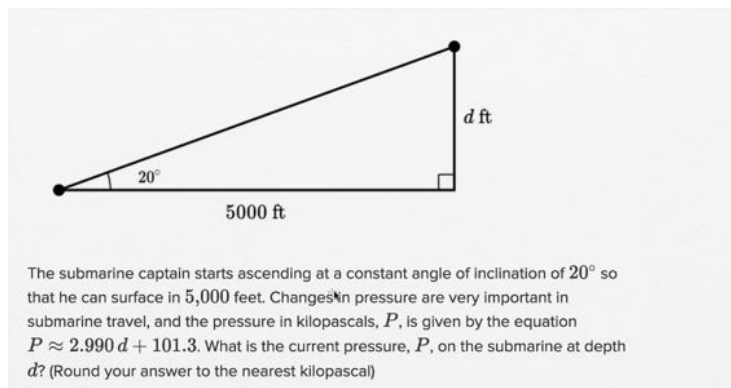
<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s2-easier>



A builder needs to add cross braces to a 3.5 meter (m) by 5 m opening between supports in a building, as shown in the figure above. Which of the following is closest to the length of one of the cross braces?

Right Triangle Word Problems- Harder

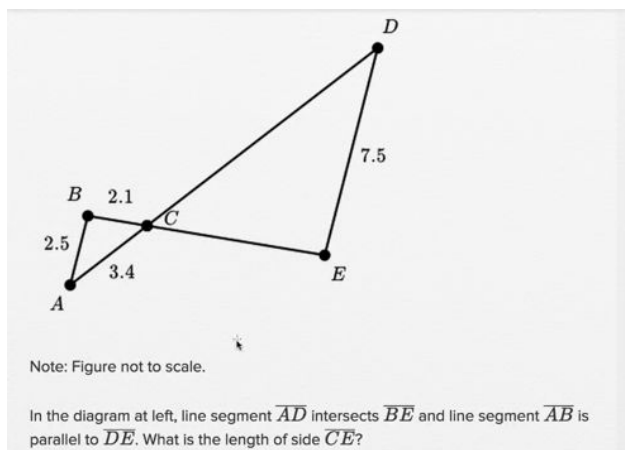
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Congruence and Similarity

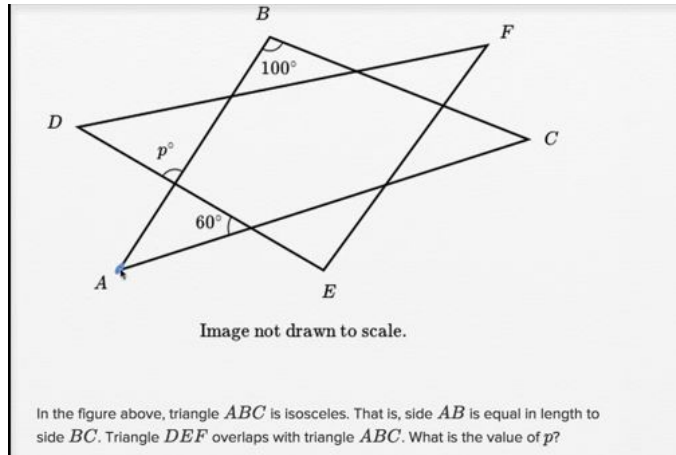
Congruence and Similarity- Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s6-easier>



Congruence and Similarity- Harder

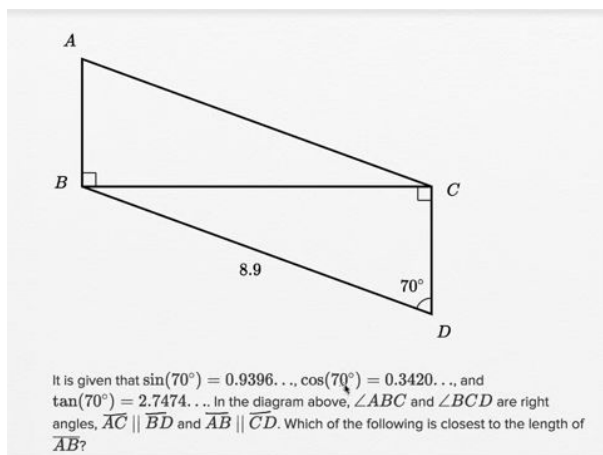
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Right Triangle Geometry

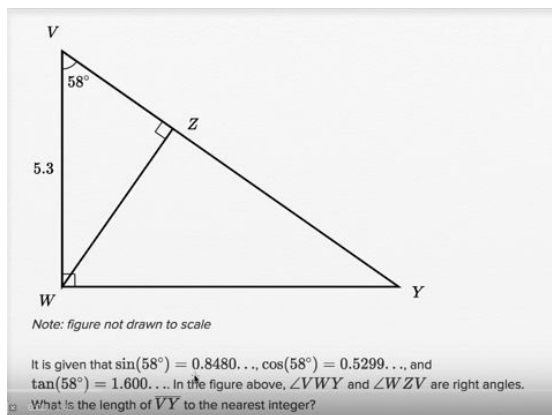
Right Triangle Geometry- Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s7-easier>



Right Triangle Geometry- Harder

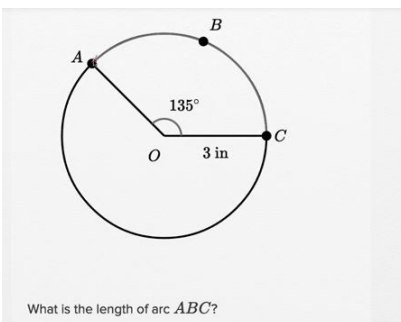
<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s7-harder>



Angles, Arc Length, and Trig Functions

Angles, Arc Length, and Trig Functions -Basic

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s4-easier>



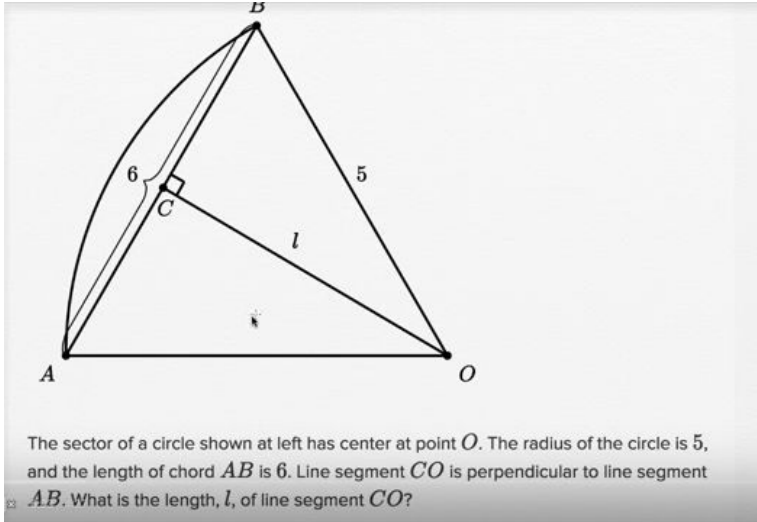
Angles, Arc Length, and Trig Functions -Harder

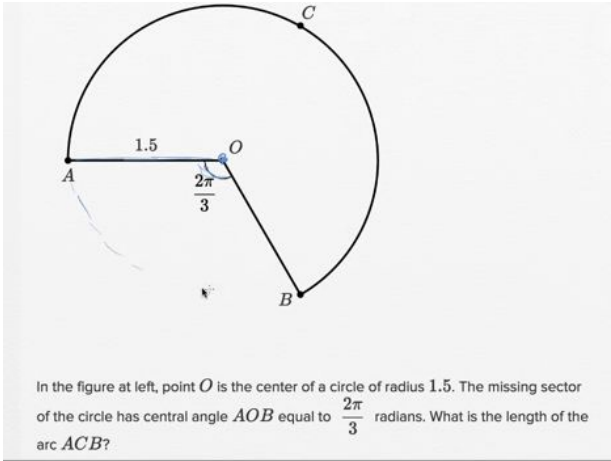
<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s4-harder>

A circle has a circumference of 10π feet (ft). An arc, x , in this circle has a central angle of 260° . What is the length of x ?

- ☐ 5 ft
- ☐ $\frac{13\pi}{9}$ ft
- ☐ $\frac{65\pi}{9}$ ft
- ☐ 260 ft

Circle Theorems

Circle Theorems-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s5-easier
 <p>The sector of a circle shown at left has center at point O. The radius of the circle is 5, and the length of chord AB is 6. Line segment CO is perpendicular to line segment AB. What is the length, l, of line segment CO?</p>	

Circle Theorems-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s5-harder
 <p>In the figure at left, point O is the center of a circle of radius 1.5. The missing sector of the circle has central angle AOB equal to $\frac{2\pi}{3}$ radians. What is the length of the arc ACB?</p>	

Circle Equations

Circle Equations-Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s8-easier
<p>A circle in the xy-plane has a diameter with endpoints at $(8, 10)$ and $(-2, 0)$. Which of the following is the center of the circle?</p> <ul style="list-style-type: none"> <input type="radio"/> $(5, 3)$ <input type="radio"/> $(3, 5)$ <input type="radio"/> $(5, 5)$ <input type="radio"/> $(6, 10)$ 	

Circle Equations-Harder	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s8-harder
<p>A circle in the xy-plane has its center at $(7, 14)$. If the point $(7, 34)$ lies on the circle, which of the following is an equation of the circle?</p> <ul style="list-style-type: none"> <input type="radio"/> $(x + 7)^2 + (y + 14)^2 = 20$ <input type="radio"/> $(x - 7)^2 + (y - 14)^2 = 20$ <input type="radio"/> $(x + 7)^2 + (y + 14)^2 = 400$ <input type="radio"/> $(x - 7)^2 + (y - 14)^2 = 400$ 	

Complex Numbers

Complex Numbers- Basic	https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s3-easier
<p>$1 + i + i^2 + i^3 + i^4 + i^5$</p> <p>Which of the following is equivalent to the complex number shown above?</p> <p>Note: $i = \sqrt{-1}$</p> <ul style="list-style-type: none"> <input type="radio"/> $1 + i$ <input type="radio"/> $1 - i$ <input type="radio"/> i <input type="radio"/> $-i$ 	

Complex Numbers- Harder

<https://www.khanacademy.org/test-prep/new-sat/new-sat-math/new-sat-additional-topics-math/v/sat-math-s3-harder>

$$\frac{1+i}{1-i} + \frac{1}{1+i}$$

Which of the following is equivalent to the complex number shown above?

Note: $i = \sqrt{-1}$

- ☐ $\frac{2+i}{2}$
- ☐ $\frac{1}{2} - \frac{1}{2}i$
- ☐ $1+i$
- ☐ $\frac{1}{2} + \frac{1}{2}i$