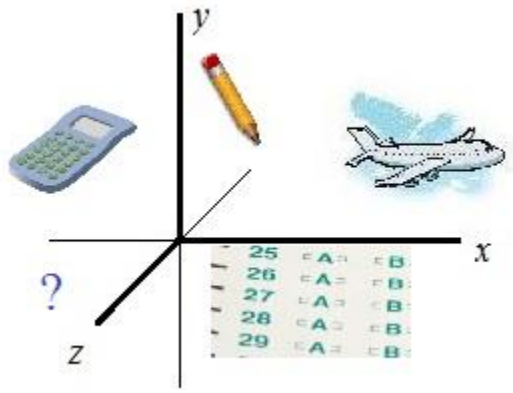
SAT Math Prep Practice Test 004

(21 multiple choice questions and answers that are similar to the redesigned SAT)



Topics include line of best fit, trigonometry functions, linear models, system of equations, proportions, imaginary number, and more.

Mathplane.com

These multiple choice questions can help prepare you for the SAT exam (revised in March 2016) or your math class tests (algebra, geometry, statistics, and more!).

SAT Practice Test 004

1) Set A = {-4, 3, 8, 10, 17}

Which element should you remove to change the mean of Set A to 6?

a) -4

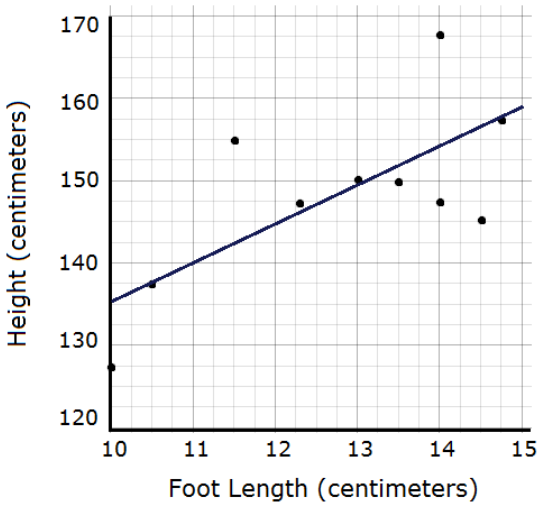
b) 3

c) 8

d) 10

e) 17

2) The scatterplot shows the relationship between foot length and height of 10 selected kids. How many of the kids have an actual height that differs by more than 5 centimeters from the height predicted by the line of best fit?



a) 2

b) 3

c) 4

d) 5

e) 6

3) A math researcher randomly selected 100 geometry students from a local high school. She asked "how many minutes per day do you study?". The mean study time was 54 minutes with a margin of error of +/-7.4 minutes.
Which of the following samples would most likely decrease the margin of error for the estimated mean time that geometry students study each day?

a) 50 randomly selected geometry students

b) 50 randomly selected students from all math departments

c) 200 randomly selected geometry students

d) 200 randomly selected students from all math departments

e) 100 randomly selected students from the entire school

4) Danny has $8.50 to spend at the fruit stand. If apples cost $1 per pound and bananas cost $.50 per pound, which inequality represents the possible amounts of fruit (in pounds) that Danny can buy?

a) $a + (1/2)b < 8.5$

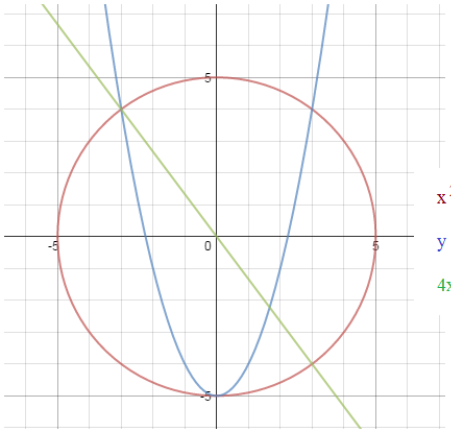
b) $a + (1/2)b \leq 8.5$

c) $a + (1/2)b > 8.5$

d) $a - (1/2)b \geq 8.5$

e) $a + (1/2)b = 8.5$

5) Here is a system of 3 equations (and their graphs in the xy-plane.)
How many solutions does the system have?



$x^2 + y^2 = 25$

$y = x^2 - 5$

$4x + 3y = 0$

a) 1

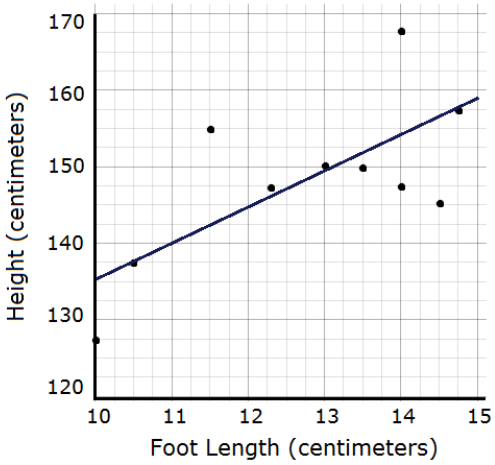
b) 2

c) 3

d) 4

e) more than 4

6) The scatterplot shows the relationship between foot length and height of 10 selected kids.
Based on the line of best fit, what is the predicted height of a kid with foot length 13.75 cm?



a) 150 cm

b) 153 cm

c) 156 cm

d) 159 cm

e) 162 cm

7) Jimmy is ordering pizzas for his math club. If each cheese pizza is \$8.95 and sales tax is 8%, and the (untaxed) tip for delivery is 7 dollars, what is the cost of p pizzas in dollars?

a) $(8.95p + 7)(.08)$

b) $(1.08)(8.95p) + 7$

c) $.8(8.95p + 7)$

d) $(1.08)(8.95p + 7)$

e) $(.08)(8.95p) + 7$

8) The table shows the students at a local high school.
Each student is classified by year and math level.
What fraction of juniors and seniors are in calculus?

	Freshmen	Sophomores	Juniors	Seniors	Totals
Algebra	52	32	16	0	100
Geometry	28	44	20	6	98
Trigonometry	17	20	59	20	116
Calculus	3	11	19	53	86
Totals	100	107	114	79	400

a) $\frac{86}{400}$

b) $\frac{72}{193}$

c) $\frac{72}{86}$

d) $\frac{193}{400}$

e) $\frac{72}{400}$

9) A calculator company manager estimates the cost of producing n items is $C = 8n + 560$. The company sells each item for $22. The company makes a profit when cost (C) is less than the revenue from selling the items.
Which of the following inequalities shows all values of n which will generate a profit?

a) $n > 0$

b) $n > 40$

c) $n > 70$

d) $n < 40$

e) $n < 70$

10) A population is expected to double in size every 8 years. The population at the beginning of 2010 is 2400 people. If P represents the population y years after 2010, which equation represents the model estimating population over time?

a) $P = 2400(2)^{8y}$

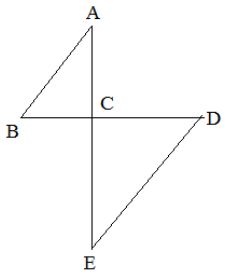
b) $P = 2400(2)^{y/8}$

c) $P = 2400 + 16y$

d) $P = 2400 + 2^{8y}$

e) $P = 2400 + 2^{y/8}$

11) Which of the following must be true?



$\triangle ABC \sim \triangle EDC$

(figure may not be drawn to scale)

a) $\overline{CE} \cong \overline{CD}$

b) $\overline{AE} \perp \overline{BD}$

c) $\overline{AB} \parallel \overline{DE}$

d) $\angle B = \angle E$

e) $\angle ACB$ is a right angle

12) The drama club charged $3 for student tickets and $7 for adult tickets. If attendance at 3 weekend performances was 189 people, and the drama club earned $799 from the show, which system of equations will produce the number of student tickets (S) and adult tickets (A) sold?

a) $S + A = 189$
$3S + 7A = 799$

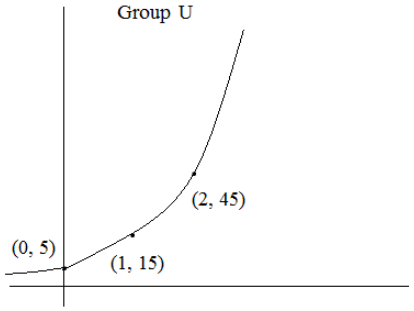
b) $S + A = 189$
$(1/3)(3S + 7A) = 799$

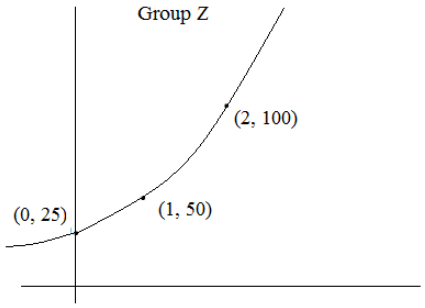
c) $S + A = 189$
$(3)(3S + 7A) = 799$

d) $(1/3)(S + A) = 189$
$(1/3)(3S + 7A) = 799$

e) $(3)(S + A) = 189$
$(3)(3S + 7A) = 799$

13) Below are the graphs of two exponential models. Which statement is true?





a) The growth factor of group U is less than group Z

b) Group U and Z have one common point

c) The output of group U is never greater than group Z

d) If you extended the curves to the left, group U would reach the x-axis first

e) If you extended the curves to the left, group Z would reach the x-axis first

14) Which is NOT a factor of $2x^2 + 6x - 8$?

a) 2

b) $x - 4$

c) $x + 1$

d) 2x

e) 1

15) If $(x + y)^2 = 80$ and $xy = -2$, then $x^2 + y^2 = ?$

a) 76

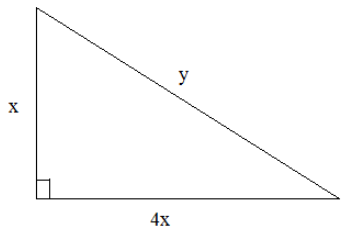
b) 84

c) $8\sqrt{5}$

d) $-8\sqrt{5}$

e) $-16\sqrt{5}$

16) What is the value of y in terms of x?



a) $\sqrt{5}\ x$

b) 5x

c) $\sqrt{17}\ x$

d) 17x

e) $\sqrt{5x}$

17) If $y = \frac{1}{4}(x + 12)$ were graphed on the xy-plane, which of the statements would be *false*?

a) the y-intercept is 3

b) the x-intercept is −12

c) the line is parallel to $4x - y = 12$

d) the line is perpendicular to $4x + y = 12$

e) none of the above (i.e. all above statements are true...)

18) Joe had 2 full gallons of orange juice in a plastic bottle. He poured out 8 cups of juice into a pitcher. (There are 16 cups in 1 gallon). What percentage of the original volume of juice remains in the plastic bottle?

a) 25%

b) 33%

c) 37.5%

d) 50%

e) 75%

19) Which is equivalent to the complex number $5i^7$?

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

a) $5i$

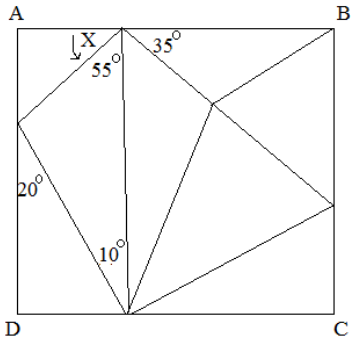
b) $-5i$

c) 5

d) 7

e) $-7i$

20) In rectangle ABCD, what is the measure of angle X?



a) 30°

b) 35°

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d) 45°

e) 50°

21) What is the value of cos(0) ?

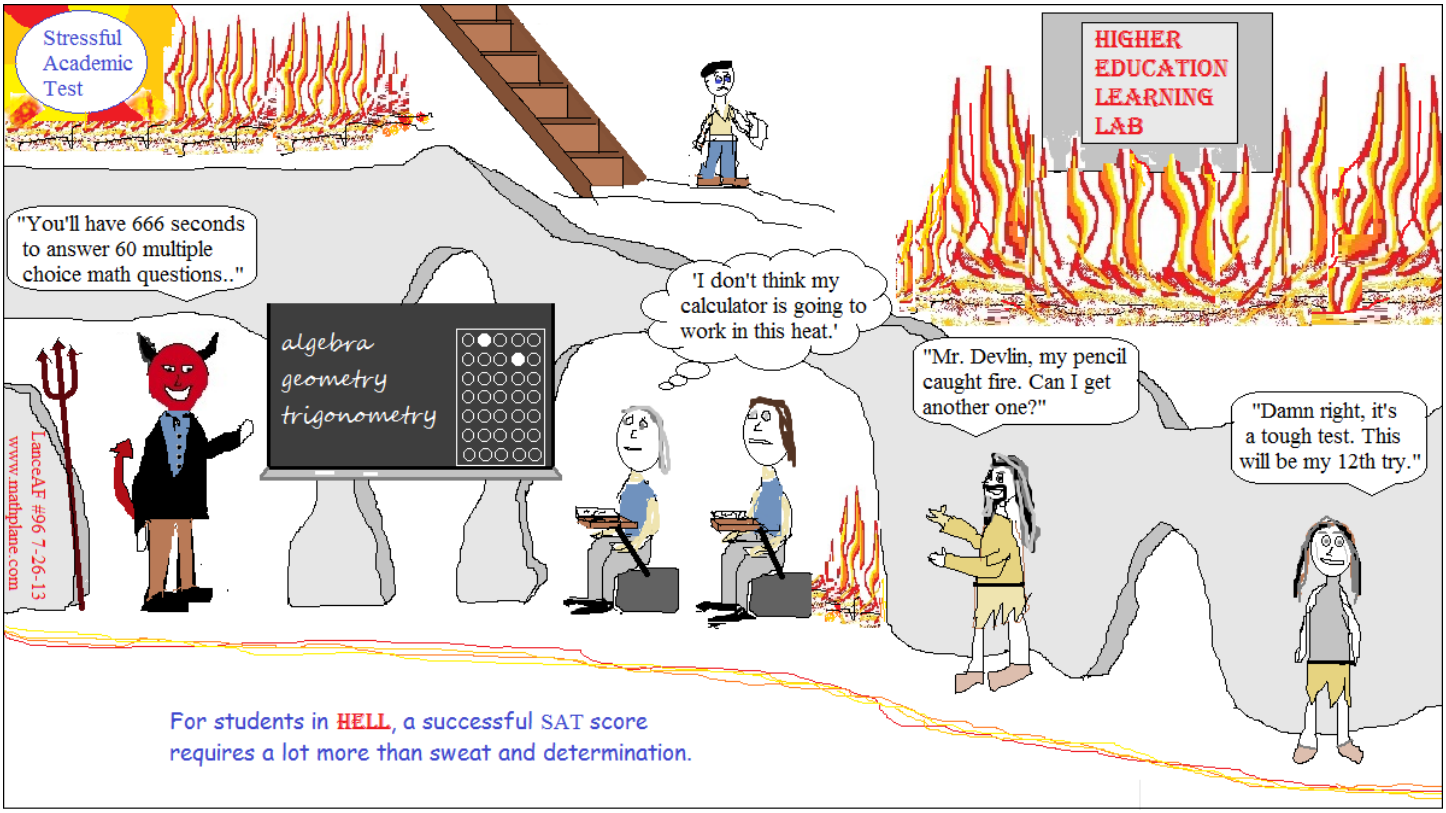
a) 0

b) 1

c) -1

d) 1/2

e) -1/2


Stressful Academic Test
HIGHER EDUCATION LEARNING LAB
"You'll have 666 seconds to answer 60 multiple choice math questions.."
algebra
geometry
trigonometry
'I don't think my calculator is going to work in this heat.'
"Mr. Devlin, my pencil caught fire. Can I get another one?"
"Damn right, it's a tough test. This will be my 12th try."
LanceAF #96 7-26-13
www.mathplane.com
For students in HELL, a successful SAT score requires a lot more than sweat and determination.

SOLUTIONS-→

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SAT Practice Test 004

SOLUTIONS

1) Set A = {-4, 3, 8, 10, 17}

Which element should you remove to change the mean of Set A to 6?

a) -4
b) 3
c) 8
d) 10
e) 17

mean = $\frac{\text{total}}{\text{\# of elements}}$

Since mean is 6 and there are 4 elements...

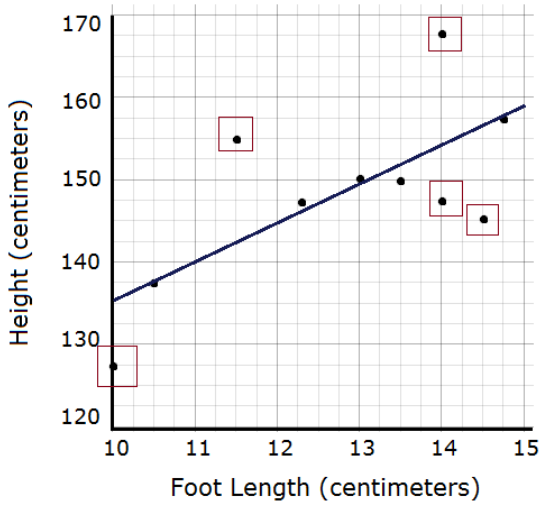
6 x 4 = 24...

If you remove the 10, then the remaining elements are -4, 3, 8, 17 and, their sum is 24...

$\frac{-4 + 3 + 8 + 17}{4} = 6$

2) The scatterplot shows the relationship between foot length and height of 10 selected kids. How many of the kids have an actual height that differs by more than 5 centimeters from the height predicted by the line of best fit?

a) 2
b) 3
c) 4
d) 5
e) 6



3) A math researcher randomly selected 100 geometry students from a local high school. She asked "how many minutes per day do you study?". The mean study time was 54 minutes with a margin of error of +/-7.4 minutes.
Which of the following samples would most likely decrease the margin of error for the estimated mean time that geometry students study each day?

a) 50 randomly selected geometry students
b) 50 randomly selected students from all math departments
c) 200 randomly selected geometry students
d) 200 randomly selected students from all math departments
e) 100 randomly selected students from the entire school

Increasing the sample size mostly decreases the margin of error...

So, c) or d) are possible choices...

However, we specifically want to focus on geomtetry students... So, c) is a better choice...

4) Danny has $8.50 to spend at the fruit stand. If apples cost $1 per pound and bananas cost $.50 per pound, which inequality represents the possible amounts of fruit (in pounds) that Danny can buy?

a) $a + (1/2)b < 8.5$
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c) $a + (1/2)b > 8.5$
d) $a - (1/2)b \geq 8.5$
e) $a + (1/2)b = 8.5$

Since Danny can spend up to or all of his money, then use the inequality $\leq$

SOLUTIONS

5) Here is a system of 3 equations (and their graphs in the xy-plane.)
How many solutions does the system have?

a) 1

b) 2

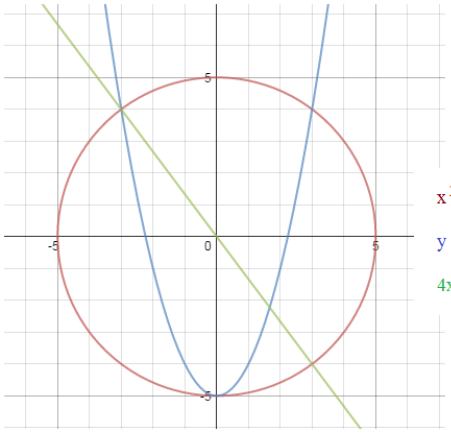
c) 3

d) 4

e) more than 4

The only solution is the point of intersection of ALL 3 functions...

(-3, 4) is the only coordinate that fits in each equation...



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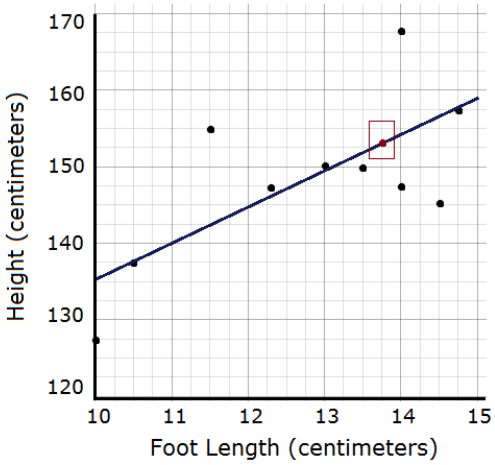

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c) $.8(8.95p + 7)$

d) $(1.08)(8.95p + 7)$

e) $(.08)(8.95p) + 7$

.8 is 80% (not 8%).. so, c) is incorrect

.08(quantity) represents the tax ONLY... so, a) and e) are incorrect

d) charges tax for the pizza and delivery...
HOWEVER,

b) charges tax for only the pizza...

8) The table shows the students at a local high school.
Each student is classified by year and math level.
What fraction of juniors and seniors are in calculus?

a) $\frac{86}{400}$

b) $\frac{72}{193}$

c) $\frac{72}{86}$

d) $\frac{193}{400}$

e) $\frac{72}{400}$

The total number of jrs. and srs. is 114 + 79 = 193

Out of the 193,
19 + 53 = 72 are in calculus

$\frac{72}{193}$

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SOLUTIONS

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Which of the following inequalities shows all values of n which will generate a profit?

a) $n > 0$
b) $n > 40$
c) $n > 70$
d) $n < 40$
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R = 22n
C = 8n + 560

Profit = Revenue - Cost

P = 22n - (8n + 560)
when is profit > 0?

14n - 560 > 0
14n > 560
n > 40

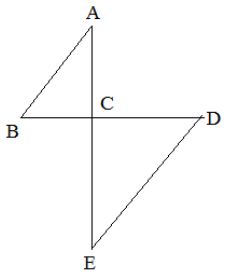
10) A population is expected to double in size every 8 years.
The population at the beginning of 2010 is 2400 people.
If P represents the population y years after 2010, which equation represents the model estimating population over time?

a) $P = 2400(2)^{8y}$
b) $P = 2400(2)^{y/8}$
c) $P = 2400 + 16y$
d) $P = 2400 + 2^{8y}$
e) $P = 2400 + 2^{y/8}$

growth function: $A = A_0(r)^t$

The amount is the population P
The initial amount is 2400
Since the population doubles, the growth factor is 2
And, since one doubling period occurs every 8 years, the exponent is 8/y

11) Which of the following must be true?



$\triangle ABC \sim \triangle EDC$

(figure may not be drawn to scale)

a) $\overline{CE} \cong \overline{CD}$
b) $\overline{AE} \perp \overline{BD}$
c) $\overline{AB} \parallel \overline{DE}$
d) $\angle B = \angle E$
e) $\angle ACB$ is a right angle

Since the triangles are similar, the corresponding angles of the triangles are congruent..
If alternate interior angles are congruent, then lines must be parallel.. c)

$\overline{AE}$ and $\overline{BD}$ may or may not be perpendicular and the triangles may or may not be isosceles

B and D are definitely =
But, B and E may or may not be =

12) The drama club charged \$3 for student tickets and \$7 for adult tickets. If attendance at 3 weekend performances was 189 people, and the drama club earned \$799 from the show, which system of equations will produce the number of student tickets (S) and adult tickets (A) sold?

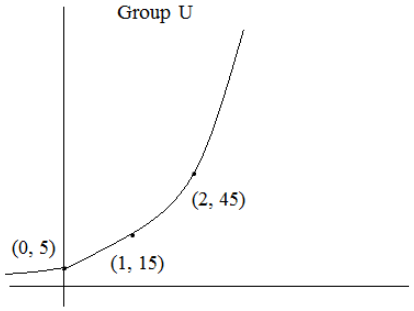
a) S + A = 189
3S + 7A = 799
b) S + A = 189
(1/3)(3S + 7A) = 799
c) S + A = 189
(3)(3S + 7A) = 799
d) (1/3)(S + A) = 189
(1/3)(3S + 7A) = 799
e) (3)(S + A) = 189
(3)(3S + 7A) = 799

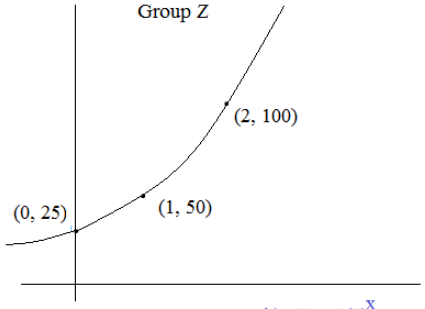
total tickets sold: S + A

Revenue from shows: 3S + 7A = 799

3S: \$3 per student ticket
7A: \$7 per adult ticket

13) Below are the graphs of two exponential models. Which statement is true?





SOLUTIONS

a) The growth factor of group U is less than group Z

b) Group U and Z have one common point

c) The output of group U is never greater than group Z

d) If you extended the curves to the left, group U would reach the x-axis first

e) If you extended the curves to the left, group Z would reach the x-axis first

b) $U = 5(3)^x$ $Z = 25(2)^x$ Outputs are equal when $x \cong 3.97$

The range of an exponential graph is > 0.. So, neither of these Groups would reach the x-axis... d) and e) are not true..

Growth factor of U is 3
Growth factor of Z is 2 a) is incorrect

Since the growth of U exceeds the growth of Z, eventually, U will exceed Z c) is incorrect...

14) Which is NOT a factor of $2x^2 + 6x - 8$?

a) 2

b) $x - 4$

c) $x + 1$

d) $2x$

e) 1

factoring:

$2(x^2 + 3x - 4)$

$2(x - 4)(x + 1)$

and, 1 is a factor of any number...

$2x^2 + 6x - 8$ is not divisible by 2x...

15) If $(x + y)^2 = 80$ and $xy = -2$, then $x^2 + y^2 = ?$

a) 76

b) 84

c) $8\sqrt{5}$

d) $-8\sqrt{5}$

e) $-16\sqrt{5}$

$(x + y)(x + y) = 80$

$x^2 + 2xy + y^2 = 80$

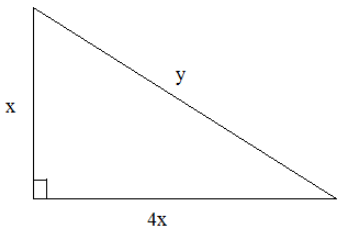
since $xy = -2$

$x^2 + y^2 + 2(-2) = 80$

$x^2 + y^2 = 80 + 4$

84

16) What is the value of y in terms of x?



a) $\sqrt{5}\,x$

b) 5x

c) $\sqrt{17}\,x$

d) 17x

e) $\sqrt{5x}$

Pythagorean Theorem: $a^2 + b^2 = c^2$

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

$17x^2 = y^2$

$y = x\sqrt{17}$ x must be non-negative

SAT Practice Test 004

SOLUTIONS

17) If $y = \frac{1}{4}(x + 12)$ were graphed on the xy-plane, which of the statements would be *false*?

a) the y-intercept is 3 — line crosses y-axis at (0, 3)

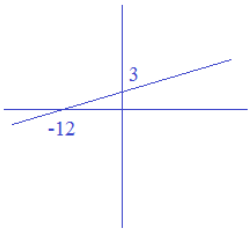
b) the x-intercept is −12 — line crosses x-axis at (-12, 0)

c) the line is parallel to $4x - y = 12$ — $y = 4x - 12$ (slope is 4)

d) the line is perpendicular to $4x + y = 12$ — $y = -4x + 12$ (slope is -4: opposite reciprocal is 1/4)

e) none of the above (i.e. all above statements are true...)

y = (1/4)x + 3



18) Joe had 2 full gallons of orange juice in a plastic bottle. He poured out 8 cups of juice into a pitcher. (There are 16 cups in 1 gallon). What percentage of the original volume of juice remains in the plastic bottle?

a) 25%

b) 33%

c) 37.5%

d) 50%

e) 75%

2 full gallons x $\frac{16 \text{ cups}}{1 \text{ gallon}}$ = 32 cups

He poured out 8 cups... (25% of bottle)

Therefore, 75% remains...

19) Which is equivalent to the complex number $5i^7$?

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

a) $5i$

b) $-5i$

c) 5

d) 7

e) $-7i$

$5 \cdot i^4 \cdot i^3$

$5 \cdot 1 \cdot -i$

20) In rectangle ABCD, what is the measure of angle X?

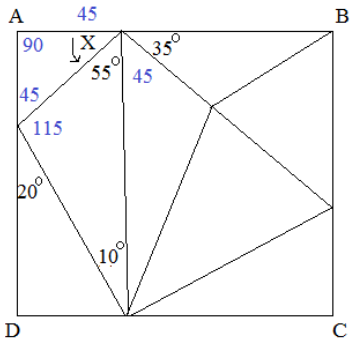
a) 30°

b) 35°

c) 40°

d) 45°

e) 50°



sum of interior angles of triangle are 180...

angles inside a rectangle are 90 degrees

sum of angles in a straight angle add up to 180

21) What is the value of cos(0) ?

a) 0

b) 1

c) -1

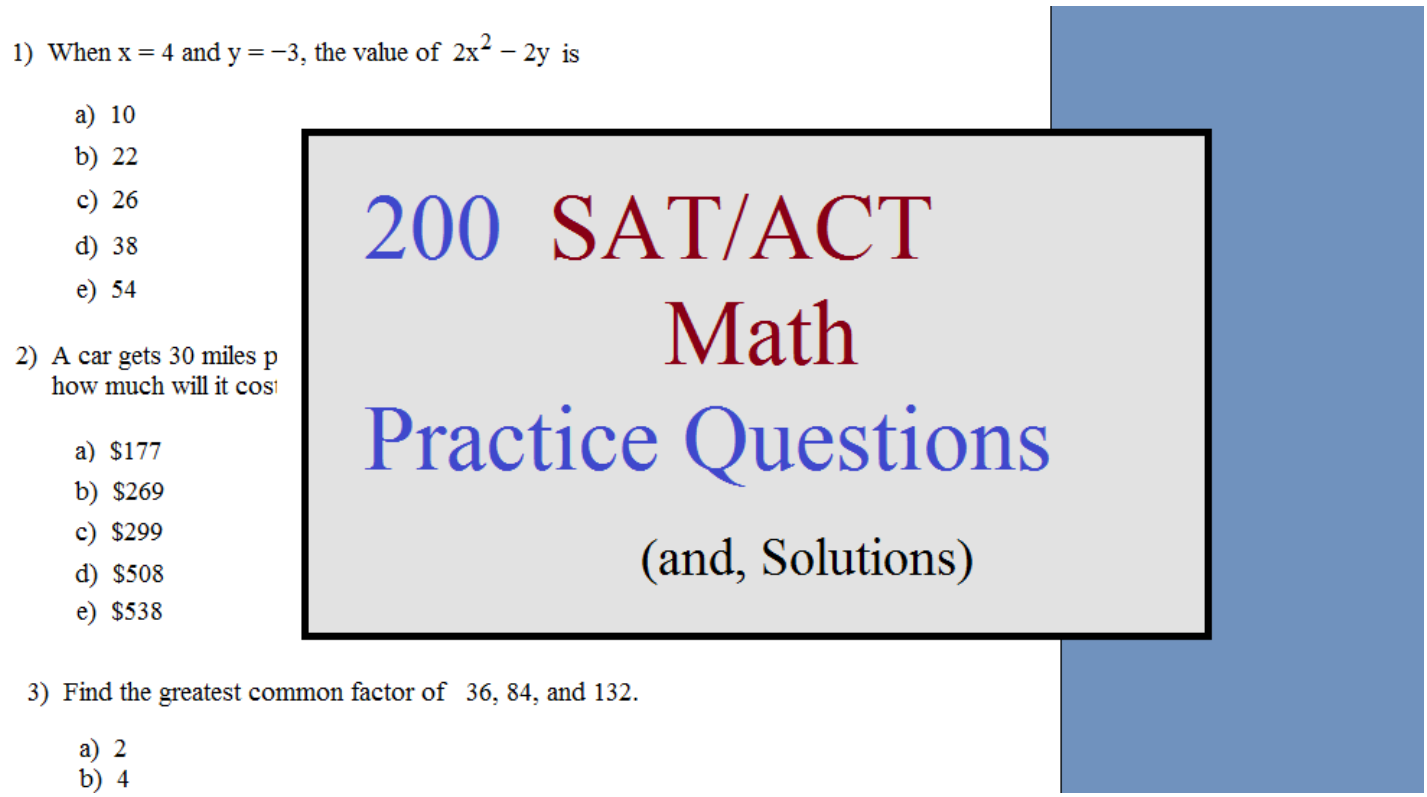
d) 1/2

e) -1/2

cos(0) = 1

cos(180) = -1

So, how did you do? Want more test prep questions?



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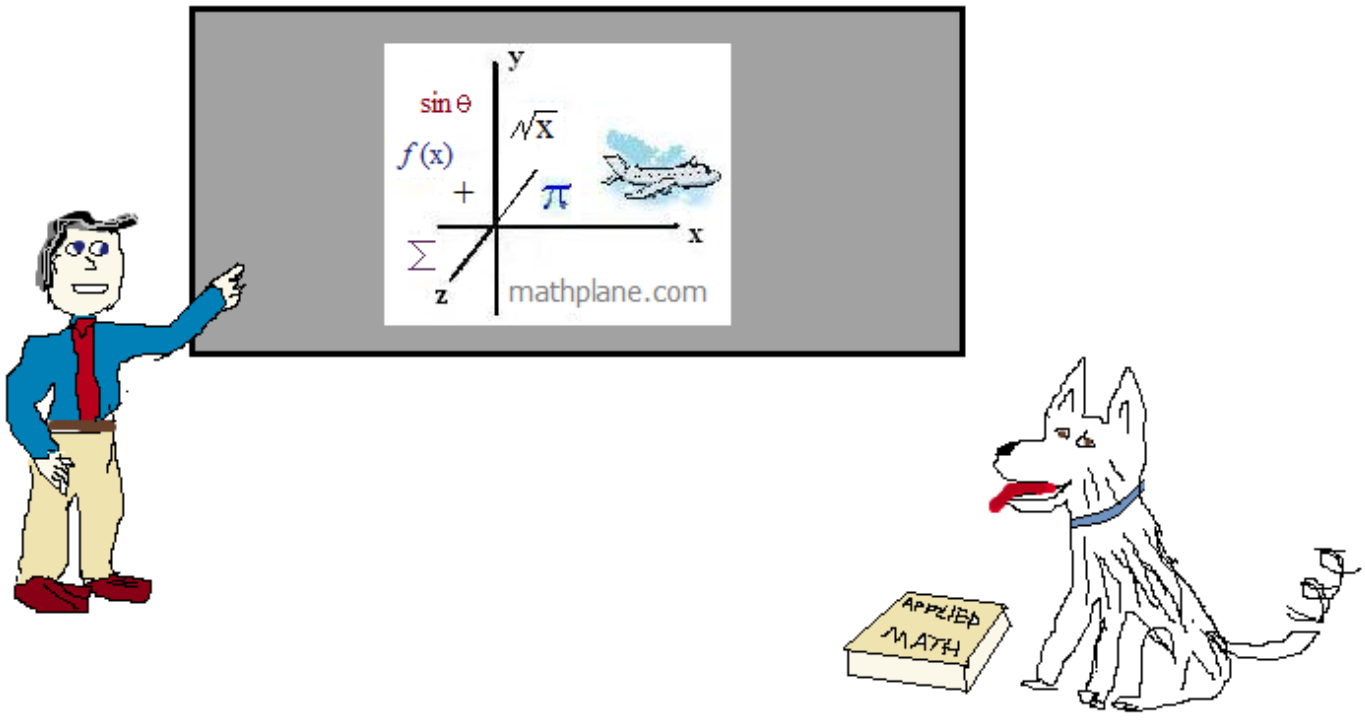
Proceeds will go to site maintenance and improvement (and treats for Oscar the dog!).

Thanks for visiting. (Hope it helped!)

If you have questions, suggestions, or requests, let us know.

Cheers



Also, at Facebook, Google+, TeachersPayTeachers, TES, and Pinterest