Summative High School Math California Standards Test (CST)
Algebra 1, Geometry, Algebra 2 Standards Review Problems

The Summative High School Math California Standards Test (CST) is taken by all students in grades 9, 10, and 11 who completed Algebra 2 in a previous school year. This includes students enrolled in Math Analysis, Calculus AP, Statistics, Statistics AP, Math Studies SL, and Math SL.

The HS Summative Math CST blueprint includes Algebra 1, Algebra 2, and Geometry standards. A summary of the blueprint is below. The complete blueprint is available on the SVUSD Math Resources for Teachers website via the SVUSD Staff Portal and on the California Department of Education (CDE) website.

Algebra 1

Standards Tested	# of items	% of CST
4.0*	1	
5.0*	3	
6.0*	2	
7.0*	1	
8.0	1	
10.0*	3	
11.0	1	
12.0*	1	
14.0*	1	
15.0*	2	
20.0*	1	
23.0*	1	
Total	**18**	**28%**

Algebra 2

Standards Tested	# of items	% of CST
1.0*	1	
2.0*	3	
3.0*	1	
4.0*	1	
6.0*	1	
7.0*	2	
8.0*	3	
10.0*	2	
11.1*	1	
12.0*	2	
14.0	1	
15.0*	1	
Total	**23**	**35%**

Geometry

Standards Tested	# of items	% of CST
3.0*	1	
4.0*	3	
5.0	2	
7.0*	2	
8.0*	1	
9.0	1	
10.0*	1	
11.0	1	
15.0	2	
18.0*	2	
19.0*	1	
21.0*	2	
Total	**19**	**29%**

Probability & Statistics

Standards Tested	# of items	% of CST
1.0	2	
2.0	2	
7.0	1	
Total	**5**	**8%**

Summary	# of items	% of CST
Algebra 1	**18**	**28%**
Algebra 2	**23**	**35%**
Geometry	**19**	**29%**
Prob & Stat	**5**	**8%**
Total	**65**	**100%**

* Key standards comprise a minimum of 70% of the test

The following pages contain Summative High School Math CST standards review problems.

Special thanks go to Mission Viejo High School math teachers Jim Cruikshank, Diane Hicks, & Mike Moore who identified the Algebra 1, Geometry, and Algebra 2 standards contained on the Summative High School Math CST blueprint and selected corresponding released test questions from 2003 – 2007 CST released test questions to create the document.

Summative High School Math California Standards Test (CST)
Algebra 1, Geometry, Algebra 2 Standards Review Problems

Answer Key

Algebra 1 Review (pages 1 – 3)

Prob	Ans	Stndrd	CST Yr
9	C	4.0	2005
11	B	5.0	2004
13	C	5.0	2006
14	B	5.0	2007
23	C	6.0	2003
26	A	6.0	2007
28	C	7.0	2003
29	A	7.0	2004
32	D	8.0	2003
33	A	8.0	2004
35	D	9.0	2004
39	B	10.0	2004
40	D	10.0	2005
41	A	10.0	2006
44	C	11.0	2003
48	A	14.0	2004
56	C	20.0	2005
57	D	20.0	2005
62	A	23.0	2003
64	B	12.0	2003
72	A	15.0	2003
74	D	15.0	2006
75	A	15.0	2006

Algebra 2 Review (pages 3 – 8)

Prob	Ans	Stndrd	CST Yr
2	D	1.0	2007
4	C	2.0	2004
7	B	2.0	2007
8	D	2.0	2007
9	D	3.0	2003
10	B	3.0	2004
14	D	4.0	2003
15	A	4.0	2005
19	A	7.0	2004
20	D	7.0	2005
28	B	6.0	2004
29	B	6.0	2005
32	A	8.0	2004
33	B	8.0	2005
37	C	10.0	2003
39	A	10.0	2006
44	D	11.1	2003
45	C	11.1	2004
50	C	12.0	2003
51	B	12.0	2004
56	B	14.0	2003
59	B	15.0	2004
63	B	18.0	2005
65	A	19.0	2005
69	A	22.0	2005
70	D	22.0	2006
71	B	24.0	2005
75	B	PS 1.0	2006
76	A	PS 1.0	2007
77	A	PS 2.0	2003
79	A	PS 7.0	2005

Geometry Review (pages 8 – 14)

Prob	Ans	Stndrd	CST Yr
8	B	3.0	2003
11	A	3.0	2006
12	D	4.0	2003
13	C	4.0	2004
14	C	4.0	2005
16	D	4.0	2006
17	A	4.0	2007
19	A	5.0	2003
20	A	5.0	2004
23	C	7.0	2003
24	B	7.0	2004
25	C	7.0	2005
27	A	7.0	2006
28	D	8.0	2003
29	C	8.0	2005
30	C	8.0	2006
33	D	9.0	2006
34	C	10.0	2003
35	A	10.0	2004
36	C	10.0	2005
38	B	10.0	2007
40	D	11.0	2004
52	B	15.0	2003
53	A	15.0	2004
62	A	18.0	2003
64	C	18.0	2006
67	B	19.0	2005
74	C	21.0	2004
75	B	21.0	2005
77	D	21.0	2007

Algebra 1 Review:

9 Which equation is equivalent to $4(2-5x)=6-3(1-3x)$?

A $8x=5$

B $8x=17$

C $29x=5$

D $29x=17$

11 Solve: $3(x+5)=2x+35$

Step 1: $3x+15=2x+35$
Step 2: $5x+15=35$
Step 3: $5x=20$
Step 4: $x=4$

Which is the first *incorrect* step in the solution shown above?

A Step 1

B Step 2

C Step 3

D Step 4

13 The cost to rent a construction crane is $750 per day plus $250 per hour of use. What is the maximum number of hours the crane can be used each day if the rental cost is not to exceed $2500 per day?

A 2.5

B 3.7

C 7.0

D 13.0

14 What is the solution to the inequality $x-5>14$?

A $x>9$

B $x>19$

C $x<9$

D $x<19$

23 What is the y-intercept of the graph of $4x+2y=12$?

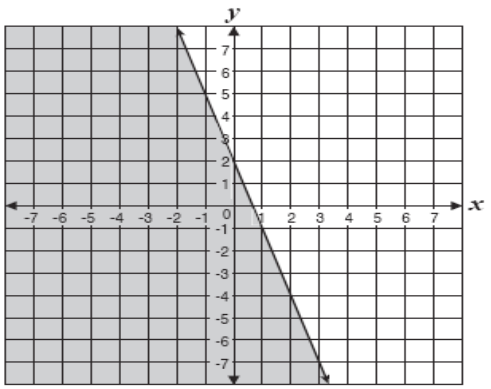
A -4

B -2

C 6

D 12

26 Which inequality does the shaded region of the graph represent?



A $3x+y\le 2$

B $3x+y\ge 2$

C $3x+y\le -2$

D $3x+y\ge -2$

CSA20055

28 Which point lies on the line defined by $3x+6y=2$?

A (0, 2)

B (0, 6)

C $\left(1,-\frac{1}{6}\right)$

D $\left(1,-\frac{1}{3}\right)$

29 What is the equation of the line that has a slope of 4 and passes through the point $(3,-10)$?

A $y=4x-22$

B $y=4x+22$

C $y=4x-43$

D $y=4x+43$

32 The equation of line l is $6x+5y=3$, and the equation of line q is $5x-6y=0$. Which statement about the two lines is true?

A Lines l and q have the same y-intercept.

B Lines l and q are parallel.

C Lines l and q have the same x-intercept.

D Lines l and q are perpendicular.

33 **Which equation represents a line that is parallel to $y=-\frac{5}{4}x+2$?**

A $y=-\frac{5}{4}x+1$

B $y=-\frac{4}{5}x+2$

C $y=\frac{4}{5}x+3$

D $y=\frac{5}{4}x+4$

35 **What is the solution to this system of equations?**

$$\begin{cases} y=-3x-2 \\ 6x+2y=-4 \end{cases}$$

A (6, 2)

B (1, –5)

C no solution

D infinitely many solutions

39 $\frac{5x^3}{10x^7}=$

A $2x^4$

B $\frac{1}{2x^4}$

C $\frac{1}{5x^4}$

D $\frac{x^4}{5}$

40 $(4x^2-2x+8)-(x^2+3x-2)=$

A $3x^2+x+6$

B $3x^2+x+10$

C $3x^2-5x+6$

D $3x^2-5x+10$

41 **The sum of two binomials is $5x^2-6x$. If one of the binomials is $3x^2-2x$, what is the other binomial?**

A $2x^2-4x$

B $2x^2-8x$

C $8x^2+4x$

D $8x^2-8x$

44 **Which is the factored form of $3a^2-24ab+48b^2$?**

A $(3a-8b)(a-6b)$

B $(3a-16b)(a-3b)$

C $3(a-4b)(a-4b)$

D $3(a-8b)(a-8b)$

48 **If x^2 is added to x, the sum is 42. Which of the following could be the value of x?**

A –7

B –6

C 14

D 42

56 **Which statement *best* explains why there is no real solution to the quadratic equation $2x^2+x+7=0$?**

A The value of $1^2-4\cdot2\cdot7$ is positive.

B The value of $1^2-4\cdot2\cdot7$ is equal to 0.

C The value of $1^2-4\cdot2\cdot7$ is negative.

D The value of $1^2-4\cdot2\cdot7$ is not a perfect square.

57 **What is the solution set of the quadratic equation $8x^2+2x+1=0$?**

A $\left\{-\frac{1}{2},\frac{1}{4}\right\}$

B $\left\{-1+\sqrt{2},-1-\sqrt{2}\right\}$

C $\left\{\frac{-1+\sqrt{7}}{8},\frac{-1-\sqrt{7}}{8}\right\}$

D no real solution

62 **An object that is projected straight downward with initial velocity v feet per second travels a distance $s = vt + 16t^2$, where t = time in seconds. If Ramón is standing on a balcony 84 feet above the ground and throws a penny straight down with an initial velocity of 10 feet per second, in how many seconds will it reach the ground?**

A 2 seconds

B 3 seconds

C 6 seconds

D 8 seconds

64 **What is $\frac{x^2 - 4xy + 4y^2}{3xy - 6y^2}$ reduced to lowest terms?**

A $\frac{x-2y}{3}$

B $\frac{x-2y}{3y}$

C $\frac{x+2y}{3}$

D $\frac{x+2y}{3y}$

72 **A pharmacist mixed some 10%-saline solution with some 15%-saline solution to obtain 100 mL of a 12%-saline solution. How much of the 10%-saline solution did the pharmacist use in the mixture?**

A 60 mL

B 45 mL

C 40 mL

D 25 mL

=

74 **One pipe can fill a tank in 20 minutes, while another takes 30 minutes to fill the same tank. How long would it take the two pipes together to fill the tank?**

A 50 min

B 25 min

C 15 min

D 12 min

75 **Two airplanes left the same airport traveling in opposite directions. If one airplane averages 400 miles per hour and the other airplane averages 250 miles per hour, in how many hours will the distance between the two planes be 1625 miles?**

A 2.5

B 4

C 5

D 10.8

Algebra II Review:

2 **What are the possible values of x in $|12 - 4x| = 2$?**

A $x = -2.50$ or $x = -3.50$

B $-3.50 < x < -2.50$

C $3.5 > x > 2.5$

D $x = 2.50$ or $x = 3.50$

4 **What is the solution to the system of equations shown below?**

$$\begin{cases} 2x - y + 3z = 8 \\ x - 6y - z = 0 \\ -6x + 3y - 9z = 24 \end{cases}$$

A $(0,4,4)$

B $\left(1,4,\frac{10}{3}\right)$

C no solution

D infinitely many solutions

7 **Which point lies in the solution set for the system** $\begin{cases} 2y - x \geq -6 \\ 2y - 3x < -6 \end{cases}$?

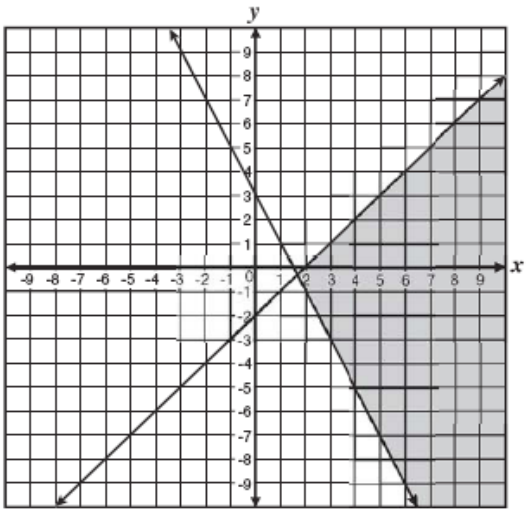
A $(-4, -1)$

B $(3, 1)$

C $(0, -3)$

D $(4, 3)$

8 **Which system of linear inequalities is represented by this graph?**



A $\begin{cases} y \geq \frac{1}{2}x + 3 \\ y \geq x - 2 \end{cases}$

B $\begin{cases} y \geq 2x + 3 \\ y \leq x - 2 \end{cases}$

C $\begin{cases} 2x - y \geq 3 \\ x + y \leq 2 \end{cases}$

D $\begin{cases} 2x + y \geq 3 \\ x - y \geq 2 \end{cases}$

9 $2x + 7 \overline{)2x^4 + 21x^3 + 35x^2 - 37x + 46}$

A $x^3 + 7x^2 - 7x + 6 - \frac{4}{2x+7}$

B $2x^3 + 14x^2 - 14x + 12 - \frac{4}{2x+7}$

C $x^3 - 7x^2 + 7x - 6 + \frac{4}{2x+7}$

D $x^3 + 7x^2 - 7x + 6 + \frac{4}{2x+7}$

10 **Which polynomial represents** $(3x^2 + x - 4)(2x - 5)$?

A $6x^3 - 13x^2 - 13x - 20$

B $6x^3 - 13x^2 - 13x + 20$

C $6x^3 + 13x^2 + 3x - 20$

D $6x^3 + 13x^2 + 3x + 20$

14 $8a^3 + c^3 =$

A $(2a + c)(2a + c)(2a + c)$

B $(2a - c)(4a^2 + 2ac + c^2)$

C $(2a - c)(4a^2 + 4ac + c^2)$

D $(2a + c)(4a^2 - 2ac + c^2)$

15 **The total area of a rectangle is** $4x^4 - 9y^2$. **Which factors could represent the length times width?**

A $(2x^2 - 3y)(2x^2 + 3y)$

B $(2x^2 + 3y)(2x^2 + 3y)$

C $(2x - 3y)(2x - 3y)$

D $(2x + 3y)(2x - 3y)$

19 Which is a simplified form of $\frac{3a^2b^3c^{-2}}{(a^{-1}b^2c)^3}$?

A $\frac{3a^5}{b^3c^5}$

B $\frac{3ab}{c^5}$

C $\frac{3}{b^2c^5}$

D $\frac{3}{ab^3c^5}$

20 What is $\frac{20x^{-4}}{27y^2} \div \frac{8x^{-3}}{15y^{-5}}$?

A $\frac{32y^3}{81x}$

B $\frac{32}{81xy^7}$

C $\frac{25y^3}{18x}$

D $\frac{25}{18xy^7}$

28 What is an equivalent form of $\frac{2}{3+i}$?

A $\frac{3-i}{4}$

B $\frac{3-i}{5}$

C $\frac{4-i}{4}$

D $\frac{4-i}{5}$

29 What is the product of the complex numbers $(3+i)$ and $(3-i)$?

A 8

B 10

C $9-i$

D $10-6i$

32 What are the solutions to the equation $1+\frac{1}{x^2}=\frac{3}{x}$?

A $x=\frac{3}{2}+\frac{\sqrt{5}}{2}; x=\frac{3}{2}-\frac{\sqrt{5}}{2}$

B $x=3+\frac{\sqrt{5}}{2}; x=3-\frac{\sqrt{5}}{2}$

C $x=\frac{3}{2}+\frac{\sqrt{13}}{2}; x=\frac{3}{2}-\frac{\sqrt{13}}{2}$

D $x=3+\frac{\sqrt{13}}{2}; x=3-\frac{\sqrt{13}}{2}$

33 There are two numbers with the following properties.

1) The second number is 3 more than the first number.

2) The product of the two numbers is 9 more than their sum.

Which of the following represents possible values of these two numbers?

A $-6,-3$

B $-4,-1$

C $-1,4$

D $-3,6$

37 What are the x-intercepts of the graph of $y=12x^2-5x-2$?

A 1 and $-\frac{1}{6}$

B -1 and $\frac{1}{6}$

C $\frac{2}{3}$ and $-\frac{1}{4}$

D $-\frac{2}{3}$ and $\frac{1}{4}$

39 **Which ordered pair is the vertex of $f(x) = x^2 + 6x + 5$?**

A $(-3, -4)$

B $(-2, -3)$

C $(-1, 0)$

D $(0, -5)$

44 **What is the solution to the equation $5^x = 17$?**

A $x = 2$

B $x = \log_{10} 2$

C $x = \log_{10} 17 + \log_{10} 5$

D $x = \dfrac{\log_{10} 17}{\log_{10} 5}$

45 **If $\log_{10} x = -2$, what is the value of x ?**

A $x = -\sqrt{\dfrac{1}{10}}$

B $x = \sqrt{\dfrac{1}{10}}$

C $x = \dfrac{1}{100}$

D $x = 100$

50 **A certain radioactive element decays over time according to the equation $y = A\left(\frac{1}{2}\right)^{\frac{t}{300}}$, where A = the number of grams present initially and t = time in years. If 1000 grams were present initially, how many grams will remain after 900 years?**

A 500 grams

B 250 grams

C 125 grams

D 62.5 grams

51 **Bacteria in a culture are growing exponentially with time, as shown in the table below.**

Bacteria Growth

Day	Bacteria
0	100
1	200
2	400

Which of the following equations expresses the number of bacteria, y, present at any time, t?

A $y = 100 + 2^t$

B $y = (100) \cdot (2)^t$

C $y = 2^t$

D $y = (200) \cdot (2)^t$

56 **What is the value of $\log_3 27$?**

A 2

B 3

C 6

D 9

59 **On a recent test, Jeremy wrote the equation $\frac{x^2-16}{x-4}=x+4$. Which of the following statements is correct about the equation he wrote?**

A The equation is always true.

B The equation is always true, except when $x=4$.

C The equation is never true.

D The equation is sometimes true when $x=4$.

63 **Abelardo wants to create several different 7-character screen names. He wants to use arrangements of the first 3 letters of his first name (abe), *followed by* arrangements of 4 digits in 1984, the year of his birth. How many different screen names can he create in this way?**

A 72

B 144

C 288

D 576

65 **Teresa and Julia are among 10 students who have applied for a trip to Washington, D.C. Two students from the group will be selected at random for the trip. What is the probability that Teresa and Julia will be the 2 students selected?**

A $\frac{1}{45}$

B $\frac{2}{45}$

C $\frac{1}{5}$

D $\frac{2}{5}$

69 **What is the sum of the infinite geometric series $\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+\ldots$?**

A 1

B 1.5

C 2

D 2.5

70 **What is the nth term in the arithmetic series below?**

$$3+7+11+15+19\ldots$$

A $4n$

B $3+4n$

C $2n+1$

D $4n-1$

71 **Which expression represents $f(g(x))$ if $f(x)=x^2-1$ and $g(x)=x+3$?**

A x^3+3x^2-x-3

B x^2+6x+8

C x^2+x+2

D x^2+8

75 **On a certain day the chance of rain is 80% in San Francisco and 30% in Sydney. Assume that the chance of rain in the two cities is independent. What is the probability that it will *not* rain in either city?**

A 7%

B 14%

C 24%

D 50%

76 **One bag contains 2 green marbles and 4 white marbles, and a second bag contains 3 green marbles and 1 white marble. If Trent randomly draws one marble from each bag, what is the probability that they are both green?**

A $\frac{1}{4}$

B $\frac{2}{5}$

C $\frac{1}{2}$

D $\frac{5}{6}$

77 **A box contains 7 large red marbles, 5 large yellow marbles, 3 small red marbles, and 5 small yellow marbles. If a marble is drawn at random, what is the probability that it is yellow, given that it is one of the large marbles?**

A $\frac{5}{12}$

B $\frac{7}{20}$

C $\frac{5}{8}$

D $\frac{1}{5}$

79 **A small-business owner must hire seasonal workers as the need arises. The following list shows the number of employees hired monthly for a 5-month period.**

4, 13, 5, 6, 9

If the mean of these data is approximately 7, what is the population standard deviation for these data? (Round the answer to the nearest tenth.)

A 3.3

B 7.4

C 10.8

D 13.5

Geometry Review:

8 ***"Two lines in a plane always intersect in exactly one point."***

Which of the following best describes a *counterexample* to the assertion above?

A coplanar lines

B parallel lines

C perpendicular lines

D intersecting lines

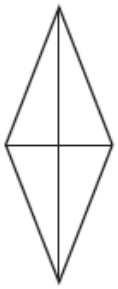
11 **A conditional statement is shown below.**

> If a quadrilateral has perpendicular diagonals, then it is a rhombus.

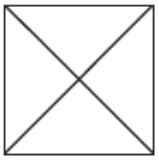
Which of the following is a counterexample to the statement above?

A

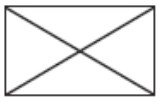
C



B



D



12 **Which triangles must be similar?**

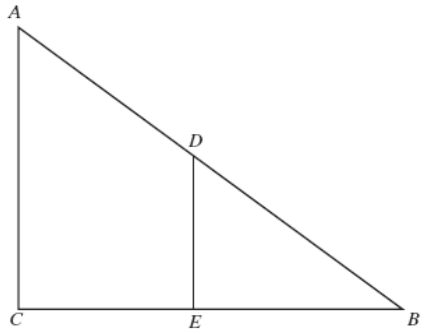
A two obtuse triangles

B two scalene triangles with congruent bases

C two right triangles

D two isosceles triangles with congruent vertex angles

13 **Which of the following facts would be sufficient to prove that triangles *ABC* and *DBE* are similar?**



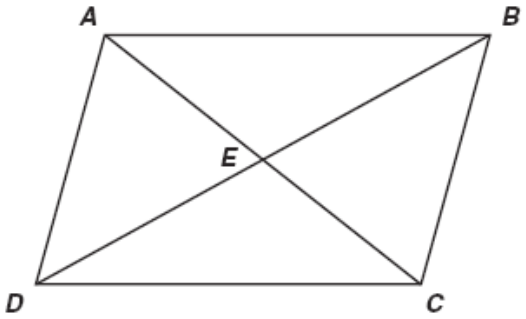
A $\overline{CE}$ and $\overline{BE}$ are congruent.

B $\angle ACE$ is a right angle.

C $\overline{AC}$ and $\overline{DE}$ are parallel.

D $\angle A$ and $\angle B$ are congruent.

14 **Parallelogram *ABCD* is shown below.**



Which pair of triangles can be established to be congruent to prove that $\angle DAB \cong \angle BCD$?

A $\triangle ADC$ and $\triangle BCD$

B $\triangle AED$ and $\triangle BEC$

C $\triangle DAB$ and $\triangle BCD$

D $\triangle DEC$ and $\triangle BEA$

16 **In parallelogram *FGHI*, diagonals $\overline{IG}$ and $\overline{FH}$ are drawn and intersect at point *M*. Which of the following statements *must* be true?**

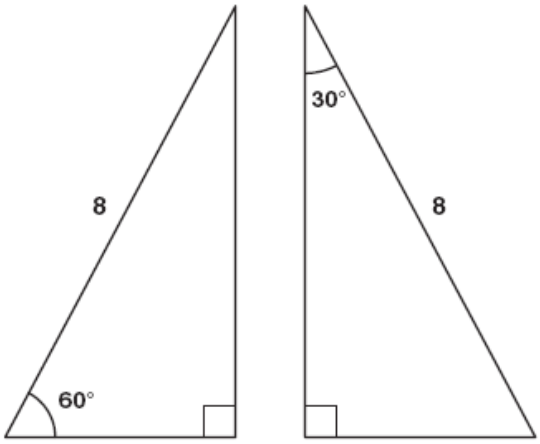
A $\triangle FGI$ must be an obtuse triangle.

B $\triangle HIG$ must be an acute triangle.

C $\triangle FMG$ must be congruent to $\triangle HMG$.

D $\triangle GMH$ must be congruent to $\triangle IMF$.

17 **Which of the following *best* describes the triangles shown below?**



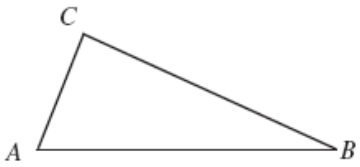
A both similar and congruent

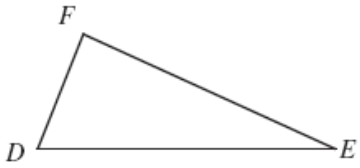
B similar but not congruent

C congruent but not similar

D neither similar nor congruent

19 **In the figure below, $\overline{AC} \cong \overline{DF}$ and $\angle A \cong \angle D$.**





Which additional information would be enough to prove that $\triangle ABC \cong \triangle DEF$?

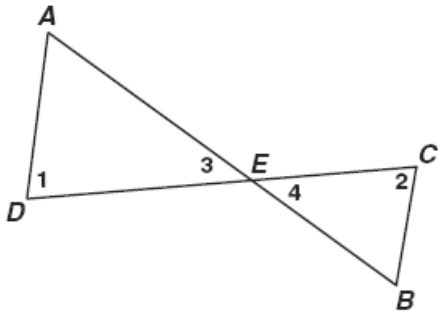
A $\overline{AB} \cong \overline{DE}$

B $\overline{AB} \cong \overline{BC}$

C $\overline{BC} \cong \overline{EF}$

D $\overline{BC} \cong \overline{DE}$

20 Given: $\overline{AB}$ and $\overline{CD}$ intersect at point E;
$\angle 1 \cong \angle 2$



Which theorem or postulate can be used to prove $\triangle AED \sim \triangle BEC$?

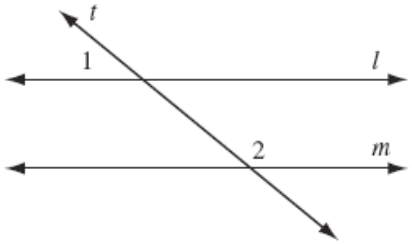
A AA

B SSS

C ASA

D SAS

23 **In the accompanying diagram, parallel lines l and m are cut by transversal t.**



Which statement about angles 1 and 2 *must* be true?

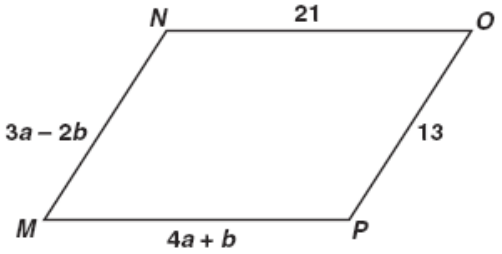
A $\angle 1 \cong \angle 2$.

B $\angle 1$ is the complement of $\angle 2$.

C $\angle 1$ is the supplement of $\angle 2$.

D $\angle 1$ and $\angle 2$ are right angles.

24 **What values of a and b make quadrilateral $MNOP$ a parallelogram?**



A $a = 1, b = 5$

B $a = 5, b = 1$

C $a = \frac{11}{7}, b = \frac{34}{7}$

D $a = \frac{34}{7}, b = \frac{11}{7}$

25 **Quadrilateral $ABCD$ is a parallelogram. If adjacent angles are congruent, which statement must be true?**

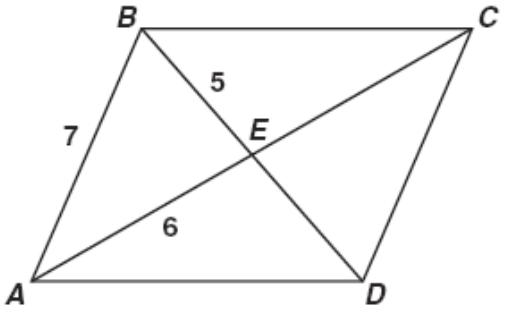
A Quadrilateral $ABCD$ is a square.

B Quadrilateral $ABCD$ is a rhombus.

C Quadrilateral $ABCD$ is a rectangle.

D Quadrilateral $ABCD$ is an isosceles trapezoid.

27 **If $ABCD$ is a parallelogram, what is the length of segment BD?**



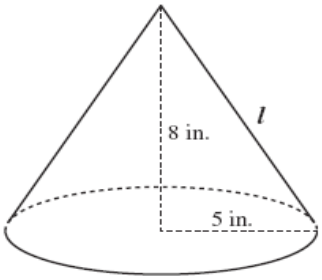
A 10

B 11

C 12

D 14

28 **A right circular cone has radius 5 inches and height 8 inches.**



What is the lateral area of the cone? (Lateral area of cone $= \pi rl$, where l = slant height)

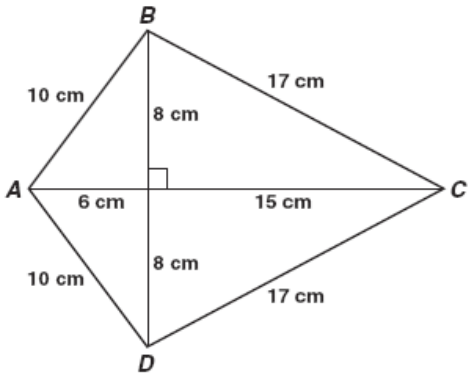
A 40π sq in.

B 445π sq in.

C $5\pi\sqrt{39}$ sq in.

D $5\pi\sqrt{89}$ sq in.

29 **Figure *ABCD* is a kite.**



What is the area of figure *ABCD*, in square centimeters?

A 120

B 154

C 168

D 336

30 **If a cylindrical barrel measures 22 inches in diameter, how many inches will it roll in 8 revolutions along a smooth surface?**

A 121π in.

B 168π in.

C 176π in.

D 228π in.

33 **A classroom globe has a diameter of 18 inches.**

Which of the following is the approximate surface area, in square inches, of the globe? (Surface Area $= 4\pi r^2$)

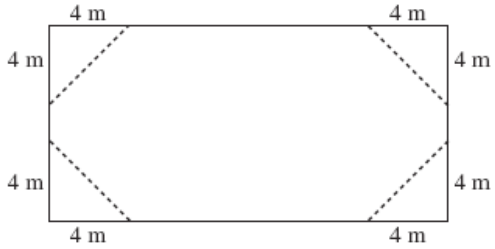
A 113.0

B 226.1

C 254.3

D 1017.4

34 **The rectangle shown below has length 20 meters and width 10 meters.**



If four triangles are removed from the rectangle as shown, what will be the area of the remaining figure?

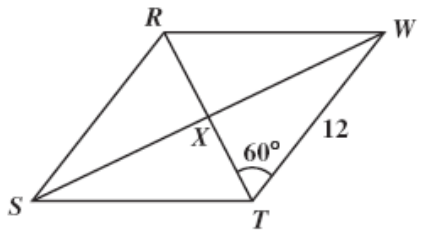
A 136 m²

B 144 m²

C 168 m²

D 184 m²

35 If *RSTW* is a rhombus, what is the area of $\triangle WXT$?



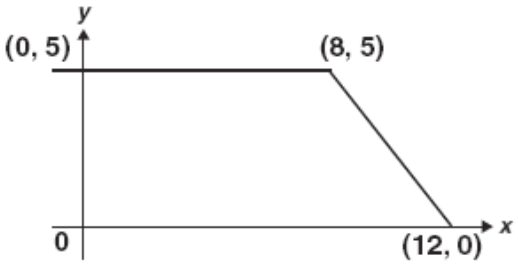
A $18\sqrt{3}$

B $36\sqrt{3}$

C 36

D 48

36 What is the area, in square units, of the trapezoid shown below?



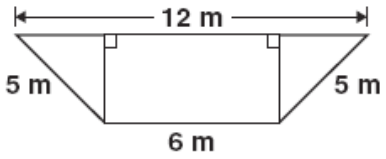
A 37.5

B 42.5

C 50

D 100

38 What is the area, in square meters (m), of the trapezoid shown below?



A 28

B 36

C 48

D 72

40 The perimeters of two squares are in a ratio of 4 to 9. What is the ratio between the areas of the two squares?

A 2 to 3

B 4 to 9

C 16 to 27

D 16 to 81

52 A right triangle's hypotenuse has length 5. If one leg has length 2, what is the length of the other leg?

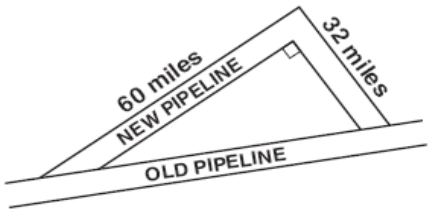
A 3

B $\sqrt{21}$

C $\sqrt{29}$

D 7

53 A new pipeline is being constructed to re-route its oil flow around the exterior of a national wildlife preserve. The plan showing the old pipeline and the new route is shown below.



About how many extra miles will the oil flow once the new route is established?

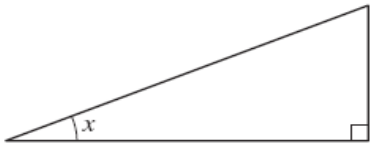
A 24

B 68

C 92

D 160

62 **In the figure below, if $\sin x = \frac{5}{13}$, what are $\cos x$ and $\tan x$?**



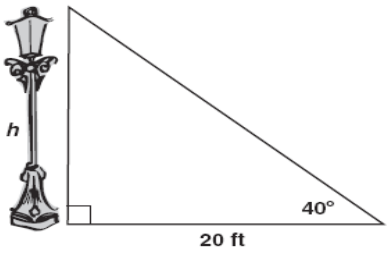
A $\cos x = \frac{12}{13}$ and $\tan x = \frac{5}{12}$

B $\cos x = \frac{12}{13}$ and $\tan x = \frac{12}{5}$

C $\cos x = \frac{13}{12}$ and $\tan x = \frac{5}{12}$

D $\cos x = \frac{13}{12}$ and $\tan x = \frac{13}{5}$

64 **Approximately how many feet tall is the streetlight?**



$\sin 40° \approx 0.64$
$\cos 40° \approx 0.77$
$\tan 40° \approx 0.84$

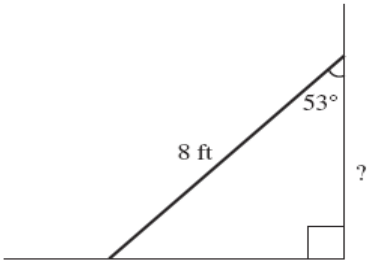
A 12.8

B 15.4

C 16.8

D 23.8

67 **The diagram shows an 8-foot ladder leaning against a wall. The ladder makes a 53° angle with the wall. Which is closest to the distance up the wall the ladder reaches?**



$\sin 53° \approx 0.80$
$\cos 53° \approx 0.60$
$\tan 53° \approx 1.33$

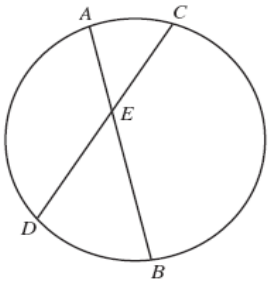
A 3.2 ft

B 4.8 ft

C 6.4 ft

D 9.6 ft

74 **In the circle below, $\overline{AB}$ and $\overline{CD}$ are chords intersecting at E.**



If $AE = 5$, $BE = 12$, and $CE = 6$, what is the length of $\overline{DE}$?

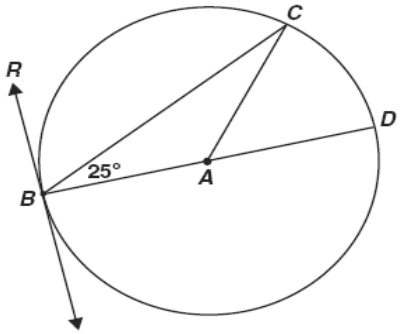
A 7

B 9

C 10

D 13

75 $\overline{RB}$ **is tangent to a circle, whose center is** A**, at point** B**.** $\overline{BD}$ **is a diameter.**



What is $m\angle CBR$**?**

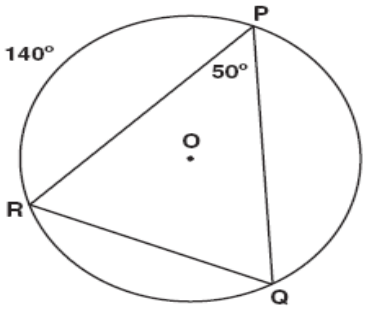
A 50°

B 65°

C 90°

D 130°

77 **In the circle shown below, the measure of** $\overset{\frown}{PR} = 140°$ **and the measure of** $\angle RPQ = 50°$**.**



What is the measure of $\overset{\frown}{PQ}$**?**

A 50°

B 60°

C 70°

D 120°