SAT Math Practice Test 1

McCreesh Math · Printable edition

Module 1 · Module 2 (easier) · Module 2 (harder)

Take Module 1 (22 questions, 35 min). Score it with the key in the back. **15 or more correct → take the harder Module 2; 14 or fewer → take the easier Module 2.** Then score Module 2 and use the online version for a score report by content area.

Answer keys and worked solutions start after the three modules.

Module 1

22 questions · 35 minutes · calculator allowed. Show work in the space below each problem.

1. The solution to the system of equations below is (x, y). What is the value of y?

$$\begin{cases} -3x - 2y = -31 \\ x + 2y = 17 \end{cases}$$

A) 2

B) 5

C) 6

D) 12

2. The number of bacteria in a culture is modeled by $N(t) = 200(3)^t$, where t is the number of hours since the culture was started. How many bacteria are in the culture after 2 hours?

Student-produced response. Write your answer in the box:

3. A town has an area of 12 square miles and a population of 720 people. What is the population density, in people per square mile?

A) 12
B) 55
C) 58
D) 60

4. A circular pizza has a diameter of 14 inches. What is the area, in square inches, of the pizza?

A) 14π
B) 7π
C) 49π
D) 196π

5. If $0.8x + 0.2 = 12.2$, what is the value of x?

Student-produced response. Write your answer in the box:

6. The functions f and g are defined by $f(x) = 5x + 6$ and $g(x) = 3x^2$. What is the value of $g(f(2))$?

A) 16

B) 66

C) 192

D) 768

7. A tutoring center charges a \$20 registration fee plus \$6 per session. If the total cost is \$38, how many sessions were paid for?

A) 2

B) 3

C) 5

D) 18

8. Which of the following is equivalent to $16x^2 - 25$?

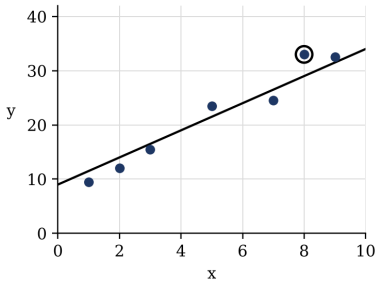
A) $(4x - 5)(4x - 5)$

B) $(4x - 5)^2$

C) $(4x - 5)(4x + 5)$

D) $(4x + 5)^2$

9. The scatterplot shows data and the line of best fit, $y = \frac{5}{2}x + 9$. A residual is the difference between the actual y-value and the y-value predicted by the line. What is the residual for the data point with $x = 8$?



Student-produced response. Write your answer in the box:

10. The temperature in degrees Celsius C is related to degrees Fahrenheit F by $C = \frac{5}{9}(F - 32)$. Which equation gives F in terms of C?

A) $F = \frac{5}{9}C + 32$

B) $F = \frac{9}{5}(C - 32)$

C) $F = \frac{9}{5}C - 32$

D) $F = \frac{9}{5}C + 32$

11. What is the minimum value of the function $f(x) = 3x^2 - 6x + 5$?

A) 1

B) 2

C) 3

D) 5

12. A cube has a surface area of 96 square centimeters. What is the volume, in cubic centimeters, of the cube?

A) 64
B) 68
C) 96
D) 125

13. The function f is defined by $f(x) = 3x + 4$. If $f(a) = 13$, what is the value of a?

A) 1
B) 2
C) 3
D) 4

14. A car uses 6 gallons of gas to travel 180 miles. At this rate, how many gallons of gas are needed to travel 1200 miles?

A) 40
B) 46
C) 200
D) 1026

15. A colony starts with 60 cells and triples in size every 4 hours. Which equation gives the number of cells V in the colony t hours after the start?

A) $V = 60 + 12t$

B) $V = 60\,(\,3\,)^{\,4t}$

C) $V = 60\,(\,3\,)^{\,t}$

D) $V = 60\,(\,3\,)^{\,\frac{t}{4}}$

16. Plan A charges a monthly fee of \$50 plus \$0.10 per minute of calls. Plan B charges a monthly fee of \$10 plus \$0.20 per minute. For how many minutes of calls in a month do the two plans cost the same?

A) 200

B) 400

C) 520

D) 800

17. The equation $x^2 + 4x + 4 = 0$ can be rewritten in the form $(x + 2)^2 = k$, where k is a constant. What is the value of k?

A) 0

B) 1

C) 4

D) 8

18. For what value of k does the equation $9(x-1)+1=9x+k$ have infinitely many solutions?

Student-produced response. Write your answer in the box: ☐

19. A cylinder has a height equal to twice its radius. The volume of the cylinder is 54π cubic units. What is the radius of the cylinder?

Student-produced response. Write your answer in the box: ☐

20. At a school, 20% of the students are in the music program. Of the students in the music program, 30% play a brass instrument. If 24 students play a brass instrument, how many students attend the school?

A) 400
B) 480
C) 500
D) 800

21. The equation $x^2 + kx + 9 = 0$, where k is a constant, has no real solutions. Which of the following must be true about k?

A) $-6 < k < 6$

B) $k < -6$ or $k > 6$

C) $-3 < k < 3$

D) $k > 6$

22. Line ℓ in the xy-plane has the equation $4x + 5y = 19$. Line m is perpendicular to line ℓ and passes through the point $(12, 0)$. What is the y-intercept of line m?

A) -25

B) -17

C) -15

D) 0

Module 2 – Easier

22 questions · 35 minutes · calculator allowed. Show work in the space below each problem.

1. A population of insects doubles every 4 days. If there are 120 insects at the start, how many insects will there be after 12 days?

A) 144
B) 480
C) 960
D) 1,920

2. A line in the xy-plane passes through the points $(-2, -4)$ and $(2, 12)$. What is the slope of the line?

A) 3
B) 4
C) 5
D) 9

3. The measures of the angles of a triangle are in the ratio $1:3:5$. What is the measure, in degrees, of the largest angle?

A) 20
B) 80
C) 100
D) 110

4. A jar contains 5 red marbles, 7 blue marbles, and 3 green marbles. One marble is chosen at random. What is the probability that the marble is not blue?

A) $\frac{1}{3}$
B) $\frac{8}{15}$
C) $\frac{4}{7}$
D) $\frac{4}{5}$

5. What is the value of $8^{\frac{2}{3}}$?

A) 4
B) 6
C) 12
D) 64

6. If $5x - 2 = x + 14$, what is the value of x?

A) 2
B) 3
C) 4
D) 6

7. What is the positive solution to the equation $x^2 - 3x - 28 = 0$?

Student-produced response. Write your answer in the box:

8. A line in the xy-plane passes through the points $(2, 2)$ and $(5, 14)$. What is the y-intercept of the line?

Student-produced response. Write your answer in the box:

9. A rectangular box has a base that measures 3 inches by 4 inches and a volume of 60 cubic inches. What is the total surface area, in square inches, of the box?

A) 54
B) 60
C) 82
D) 94

10. Which of the following is equivalent to $(3x + 6)^2$?

A) $9x^2 + 18x + 36$
B) $9x^2 + 36$
C) $9x^2 - 36x + 36$
D) $9x^2 + 36x + 36$

11. The table shows three values of x and their corresponding values of y for a linear relationship. Which of the following equations represents the relationship?

x	1	4	7
y	18	39	60

A) $y = 7x + 11$
B) $y = 7x - 11$
C) $y = 11x + 7$
D) $y = 8x + 11$

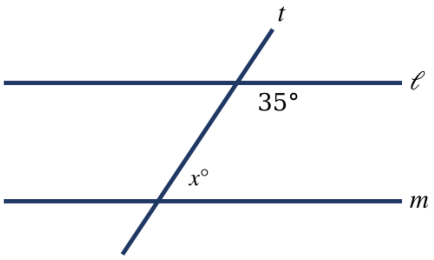
12. 45% of the 160 seeds planted in a garden sprouted. How many are there in that group?

A) 62
B) 72
C) 82
D) 88

13. If $x^2 + bx + 81 = (x + p)^2$ for all values of x, and $b > 0$, what is the value of b?

A) 16
B) 18
C) 20
D) 81

14. In the figure, lines ℓ and m are parallel and are cut by transversal t. The measure of the marked angle is 35°. What is the value of x?



Student-produced response. Write your answer in the box:

15. The function f is linear. If $f(4) = 18$ and $f(6) = 30$, what is the value of $f(9)$?

Student-produced response. Write your answer in the box: ☐

16. What is the solution to the equation $\frac{6}{x-5} = \frac{54}{x+3}$?

A) 6 **B)** 7

C) 8 **D)** 16

17. The graph of $6x + 4y = 36$ in the xy-plane has its y-intercept at $(0, b)$. What is the value of b?

A) 4 **B)** 6

C) 8 **D)** 9

18. Which of the following is equivalent to $\frac{(2x^2y)^3}{4x^2y^2}$, where $x > 0$ and $y > 0$?

A) $2x^8y$

B) $2x^4y$

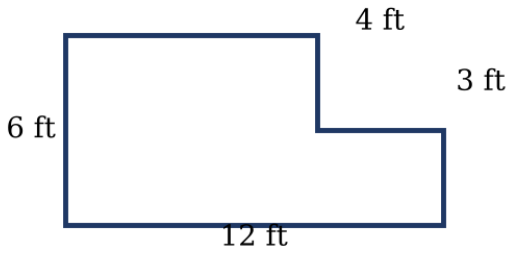
C) $4x^4y$

D) $2x^3y$

19. The regular price of a bicycle is \$80. During a sale the price is reduced by 10%. After the sale ends, the sale price is increased by 50%. What is the final price, in dollars, of the bicycle?

Student-produced response. Write your answer in the box:

20. The figure shows a floor plan made of a large rectangle that is 12 feet by 6 feet with a rectangular corner that is 4 feet by 3 feet removed. All angles are right angles. What is the area, in square feet, of the floor?



A) 12

B) 36

C) 58

D) 60

21. What is the positive difference between the solutions to the equation $|x - 7| + 3 = 8$?

A) 10
B) 11
C) 12
D) 15

22. What is the positive difference between the two solutions of $x^2 - 9x + 8 = 0$?

A) 4
B) 6
C) 7
D) 8

Module 2 – Harder

22 questions · 35 minutes · calculator allowed. Show work in the space below each problem.

1. What is the solution to the equation $\sqrt{x+11} = x - 1$?

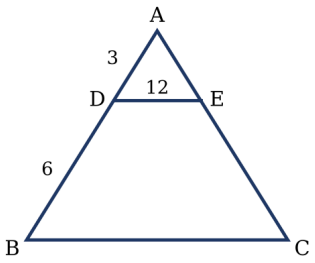
Student-produced response. Write your answer in the box: ☐

2. Which of the following values of x satisfies both $x > 3$ and $3x + 1 < 25$?

A) 1 **B)** 2

C) 3 **D)** 4

3. In the figure, segment DE is parallel to side BC of triangle ABC. $AD = 3$, $DB = 6$, and $DE = 12$. What is the length of BC?



A) 18
B) 24
C) 36
D) 38

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4. A teacher gave the same test to two classes. The 20 students in the first class had a mean score of 82, and the 10 students in the second class had a mean score of 79. What is the mean score of all 30 students?

A) 79
B) 81
C) 82
D) 83

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5. What is the remainder when $2x^3 + 4x^2 - 5x + 6$ is divided by $x - 1$?

A) 7
B) 8
C) 11
D) 13

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6. Line ℓ has the equation $y = \frac{3}{4}x + 7$. Line m is parallel to line ℓ and passes through the point $(12, 12)$. What is the y-intercept of line m?

A) 3
B) 4
C) 7
D) 12

7. The polynomial $p(x) = x^3 - 2x^2 + kx - 6$, where k is a constant, has $x - 3$ as a factor. What is the value of k?

A) -4
B) -3
C) -2
D) -1

8. In the xy-plane, a line passes through the points $(k, 5)$ and $(8, -7)$ and has slope -3. What is the value of k?

A) 1
B) 2
C) 3
D) 4

9. Two rectangular prisms are similar. The ratio of the surface area of the smaller prism to the surface area of the larger prism is $4{:}9$. The volume of the smaller prism is 224 cubic centimeters. What is the volume, in cubic centimeters, of the larger prism?

A) 252
B) 756
C) 764
D) 945

10. The function $f(x) = -x^2 + bx + c$, where b and c are constants, has a maximum value of 9 at $x = 3$. What is the value of c?

A) -2
B) -1
C) 0
D) 6

11. In the equation $(k-3)x + 7 = 8x + 5$, k is a constant. For what value of k does the equation have no solution?

A) 5
B) 8
C) 11
D) 24

12. The mean of 8 numbers is 19. The mean of 6 of these numbers is 13. What is the mean of the other 2 numbers?

A) 25
B) 37
C) 39
D) 40

13. A ball is thrown upward from a platform. Its height, in feet, t seconds after it is thrown is given by $h(t) = -16t^2 + 40t + 24$. What is the maximum height, in feet, reached by the ball?

A) 24
B) 40
C) 49
D) 73

14. The circle $x^2 + y^2 + 2y - 168 = 0$ is intersected by the line $y = 4$. What is the length of the chord formed by the line and the circle?

Student-produced response. Write your answer in the box:

15. What is the sum of all integer solutions to the inequality $|3x - 2| < 8$?

Student-produced response. Write your answer in the box:

16. If $5^{x+4} = 25^{x-3}$, what is the value of x?

Student-produced response. Write your answer in the box:

17. In the equation $ax + 9 = x + 5$, a is a constant. If $x = -4$ is a solution to the equation, what is the value of a?

Student-produced response. Write your answer in the box:

18. A quadratic function f has zeros at $x = -5$ and $x = 5$, and the graph of $y = f(x)$ passes through the point $(0, -75)$. Which of the following defines f?

A) $f(x) = x^2 - 25$

B) $f(x) = 3x^2 + 75$

C) $f(x) = 3x^2$

D) $f(x) = 3x^2 - 75$

19. A data set has the values 10, 10, 14, 19, 20. A new value of 78 is added to the data set. Which of the following statements is true?

A) The mean increases by more than the median does.

B) The mean and the median increase by the same amount.

C) The mean does not change.

D) The median increases by more than the mean does.

20. Which of the following ordered pairs (x, y) is a solution to the system of inequalities below?

$$\begin{cases} y > 2x - 3 \\ y < -2x + 5 \end{cases}$$

A) $(-3, 6)$

B) $(2, -1)$

C) $(1, 3)$

D) $(3, 3)$

21. How many distinct real solutions does the equation $|x^2 - 16| = 8$ have?

A) 4
B) 5
C) 9
D) 14

22. A cube is inscribed in a sphere so that each vertex of the cube lies on the sphere. The radius of the sphere is $4\sqrt{3}$ centimeters. What is the volume, in cubic centimeters, of the cube?

A) 64
B) 512
C) 514
D) 520

Answer Key – Test 1

Module 1

1	**B**	12	**A**
2	**1800**	13	**C**
3	**D**	14	**A**
4	**C**	15	**D**
5	**15**	16	**B**
6	**D**	17	**A**
7	**B**	18	**-8**
8	**C**	19	**3**
9	**4**	20	**A**
10	**D**	21	**A**
11	**B**	22	**C**

Module 2 (easier)

1	**C**	12	**B**
2	**B**	13	**B**
3	**C**	14	**145**
4	**B**	15	**48**
5	**A**	16	**A**
6	**C**	17	**D**
7	**7**	18	**B**
8	**-6**	19	**108**
9	**D**	20	**D**
10	**D**	21	**A**
11	**A**	22	**C**

Module 2 (harder)

1	**5**	12	**B**
2	**D**	13	**C**
3	**C**	14	**24**
4	**B**	15	**5**
5	**A**	16	**10**
6	**A**	17	**2**
7	**D**	18	**D**
8	**D**	19	**A**
9	**B**	20	**A**

10	**C**	21	**A**
11	**C**	22	**B**

Solutions – Module 1

#	Ans	Area	Solution
1	**B**	Algebra	Solving the system gives $x = 7$ and $y = 5$. Therefore $y = 5$.
2	**1800**	Advanced Math	$N(2) = 200(3)^2 = 200(9) = 1,800$.
3	**D**	Problem-Solving & Data Analysis	Density $= \frac{720}{12} = 60$ people per square mile.
4	**C**	Geometry & Trigonometry	The radius is 7 inches. Area $= \pi(7)^2 = 49\pi$.
5	**15**	Algebra	Subtract 0.2: $0.8x = 12$. Divide by 0.8: $x = 15$.
6	**D**	Advanced Math	$f(2) = 16$. $g(16) = 3(16)^2 + 0 = 768$.
7	**B**	Algebra	Write $20 + 6n = 38$. Subtract 20: $6n = 18$, so $n = 3$.
8	**C**	Advanced Math	This is a difference of squares: $(4x)^2 - 5^2 = (4x - 5)(4x + 5)$.
9	**4**	Problem-Solving & Data Analysis	The predicted value is $\frac{5}{2}(8) + 9 = 29$. The actual value is 33, so the residual is $33 - 29 = 4$.
10	**D**	Algebra	Isolate the requested variable by undoing operations in reverse order. The result is $F = \frac{9}{5}C + 32$.
11	**B**	Advanced Math	Complete the square: $f(x) = 3(x - 1)^2 + 2$. The minimum value is 2.
12	**A**	Geometry & Trigonometry	Each face has area $\frac{96}{6} = 16$, so the edge length is 4. Volume $= 4^3 = 64$.
13	**C**	Algebra	Set $3a + 4 = 13$. Then $3a = 9$, so $a = 3$.
14	**A**	Problem-Solving & Data Analysis	Set up a proportion: $\frac{6}{180} = \frac{x}{1200}$. So $x = \frac{6 \cdot 1200}{180} = 40$.
15	**D**	Advanced Math	The number of triplings in t hours is $\frac{t}{4}$, so $V = 60(3)^{t/4}$, which is $V = 60\left(3\right)^{\frac{t}{4}}$.
16	**B**	Algebra	Set the costs equal: $50 + 0.10m = 10 + 0.20m$. Then $40 = 0.10m$, so $m = 400$.
17	**A**	Advanced Math	Move the constant: $x^2 + 4x = -4$. Add 4 to both sides: $(x + 2)^2 = 0$.
18	**-8**	Algebra	Distribute: $9x - 9 + 1 = 9x + k$. Infinitely many solutions require identical sides, so $k = -8$.
19	**3**	Geometry & Trigonometry	$V = \pi r^2(2r) = 2\pi r^3 = 54\pi$, so $r^3 = 27$. Therefore $r = 3$.
20	**A**	Problem-Solving & Data Analysis	Let N be the number of students. Then $0.2 \cdot 0.3 \cdot N = 24$. So $N = \frac{24}{0.06} = 400$.
21	**A**	Advanced Math	No real solutions means the discriminant is negative: $k^2 - 4(9) < 0$, so $k^2 < 36$. Therefore $-6 < k < 6$.
22	**C**	Algebra	Line ℓ has slope $-\frac{4}{5}$, so a perpendicular line has slope $\frac{5}{4}$. Then $0 = \frac{5}{4}(12) + b$, so $b = -15$.

Solutions – Module 2 Easier

#	Ans	Area	Solution
1	**C**	Advanced Math	In 12 days there are 3 doublings, so the population is $120 \cdot 2^3 = 960$.
2	**B**	Algebra	Slope $= \frac{y_2 - y_1}{x_2 - x_1} = \frac{12 - (-4)}{2 - (-2)} = 4$.
3	**C**	Geometry & Trigonometry	The parts total 9, so each part is $\frac{180}{9} = 20$ degrees. The largest angle is $5 \cdot 20 = 100$.
4	**B**	Problem-Solving & Data Analysis	There are 15 marbles in all, and $5 + 3 = 8$ are not blue. The probability is $\frac{8}{15}$.
5	**A**	Advanced Math	$8^{\frac{2}{3}} = (\sqrt[3]{8})^2 = 2^2 = 4$.
6	**C**	Algebra	Subtract x from both sides: $4x - 2 = 14$. Add 2: $4x = 16$, so $x = 4$.
7	**7**	Advanced Math	Factor: $(x - 7)(x + 4) = 0$. The solutions are $x = 7$ and $x = -4$, so the positive solution is 7.
8	**-6**	Algebra	The slope is $\frac{14 - (2)}{5 - (2)} = 4$. Using $y = 4x + b$ and $(2, 2)$: $b = 2 - (4)(2) = -6$.
9	**D**	Geometry & Trigonometry	The height is $\frac{60}{3 \cdot 4} = 5$ inches. Surface area $= 2(3 \cdot 4 + 3 \cdot 5 + 4 \cdot 5) = 94$.
10	**D**	Advanced Math	$(3x + 6)^2 = 9x^2 + 36x + 36$.
11	**A**	Algebra	The slope is $\frac{39 - 18}{4 - 1} = 7$. Substituting $(1, 18)$: $18 = 7(1) + b$, so $b = 11$. The equation is $y = 7x + 11$.
12	**B**	Problem-Solving & Data Analysis	45% of $160 = 0.45(160) = 72$.
13	**B**	Advanced Math	Expanding, $(x + p)^2 = x^2 + 2px + p^2$, so $p^2 = 81$ and $p = 9$ (since $b > 0$). Then $b = 2p = 18$.
14	**145**	Geometry & Trigonometry	Angles that are same-side interior are supplementary, so $x = 145$.
15	**48**	Algebra	The slope is $\frac{30 - (18)}{6 - 4} = 6$. Then $f(9) = 30 + 6(9 - 6) = 48$.
16	**A**	Advanced Math	Cross-multiply: $6(x + 3) = 54(x - 5)$. $6x + 18 = 54x - 270$, so $x = 6$.
17	**D**	Algebra	Substitute $x = 0$ into the equation and solve: $4y = 36$, so the value is 9.
18	**B**	Advanced Math	Numerator: $(2x^2y)^3 = 8x^6y^3$. Divide: coefficient $\frac{8}{4} = 2$, $x^{6-2} = x^4$, $y^{3-2} = y$. The result is $2x^4y$.
19	**108**	Problem-Solving & Data Analysis	After the 10% reduction the price is $80(0.9) = 72$. After the 50% increase it is $72(1.5) = 108$.
20	**D**	Geometry & Trigonometry	Area $= 12 \cdot 6 - 4 \cdot 3 = 60$.
21	**A**	Algebra	Isolate the absolute value: $\lvert x - 7 \rvert = 5$. So $x = 7 \pm 5$, giving $x = 12$ or $x = 2$. The positive difference between the solutions is 10.
22	**C**	Advanced Math	Factor: $(x - 1)(x - 8) = 0$. The solutions are 1 and 8, and their positive difference is 7.

Solutions – Module 2 Harder

#	Ans	Area	Solution
1	**5**	Advanced Math	Square both sides: $x+11=(x-1)^2$, so $x^2-3x-10=0$. This gives $x=-2 or x=5$. Checking each in the original equation, only $x=5$ works; the other is extraneous.
2	**D**	Algebra	The second inequality gives $3x<24$, so $x<8$. Both conditions give $3<x<8$; the only listed value in this interval is 4.
3	**C**	Geometry & Trigonometry	Since $DE \parallel BC$, triangles ADE and ABC are similar with ratio $\frac{AD}{AB}=\frac{3}{9}$. So $\frac{12}{BC}=\frac{3}{9}$ and $BC=36$.
4	**B**	Problem-Solving & Data Analysis	The total of the first class is $20\cdot 82=1640$; of the second class $10\cdot 79=790$. Mean $=\frac{2430}{30}=81$.
5	**A**	Advanced Math	By the remainder theorem the remainder equals $P(1)$. $P(1)=7$.
6	**A**	Algebra	Parallel lines have equal slopes, so line m has slope $\frac{3}{4}$. Then $12=\frac{3}{4}(12)+b$, so $b=3$.
7	**D**	Advanced Math	Since $x-3$ is a factor, $p(3)=0$: $27-18+3k-6=0$. So $3k=-3$ and $k=-1$.
8	**D**	Algebra	Slope $=\frac{-7-(5)}{8-k}=-3$. So $8-k=4$ and $k=4$.
9	**B**	Geometry & Trigonometry	The ratio of surface areas is $4{:}9$, so the scale factor of lengths is $2{:}3$. Volumes scale by the cube: $2^3{:}3^3$, so the larger volume is $224\cdot\frac{27}{8}=756$.
10	**C**	Advanced Math	The vertex is at $x=-\frac{b}{2(-1)}=\frac{b}{2}=3$, so $b=6$. Then $f(3)=-9+18+c=9$, so $c=0$.
11	**C**	Algebra	Combine like terms: $(k-3-8)x=-2$. No solution requires the coefficient of x to be 0 while the right side is not, so $k=11$.
12	**B**	Problem-Solving & Data Analysis	The sum of all 8 numbers is $8\cdot 19=152$. The sum of the 6 numbers is $6\cdot 13=78$, so the other 2 numbers sum to 74. Their mean is $\frac{74}{2}=37$.
13	**C**	Advanced Math	The maximum occurs at $t=-\frac{b}{2a}=\frac{40}{32}=\frac{5}{4}$. $h(\frac{5}{4})=49$ feet.
14	**24**	Geometry & Trigonometry	Complete the square: $(x+0)^2+(y+1)^2=169$, so the center is $(0,-1)$ and the radius is 13. The line is 5 units from the center, so half the chord is $\sqrt{13^2-5^2}=12$. The chord has length 24.
15	**5**	Algebra	Rewrite as $-8<3x-2<8$, so $-2<x<\frac{10}{3}$. The integer solutions are -1, 0, 1, 2, 3, and their sum is 5.
16	**10**	Advanced Math	Write both sides with base 5: $5^{x+4}=5^{2(x-3)}$. Equate exponents: $x+4=2x-6$, so $x=10$.
17	**2**	Algebra	Substitute $x=-4$: $-4a+9=1(-4)+5$. So $-4a=-8$ and $a=2$.
18	**D**	Advanced Math	Since the zeros are -5 and 5, $f(x)=a(x+5)(x-5)$. The point $(0,-75)$ gives $a(5)(-5)=-75$, so $a=3$. Expanding gives $f(x)=3x^2-75$.
19	**A**	Problem-Solving & Data Analysis	Without the new value, the mean is about 14.6 and the median is 14. With it, the mean is about 25.2 and the median is 16.5. The mean increases by more.
20	**A**	Algebra	Test each point in both inequalities. Only $(-3,6)$ makes both true: $6>-9$ and $6<11$.
21	**A**	Advanced Math	Either $x^2-16=8$ or $x^2-16=-8$. These give $x^2=24$ and $x^2=8$, so the equation has 4 distinct real solutions.
22	**B**	Geometry & Trigonometry	The space diagonal of the cube equals the diameter of the sphere: $8\sqrt{3}$. A cube with edge s has space diagonal $s\sqrt{3}$, so $s=8$ and the volume is $8^3=512$.