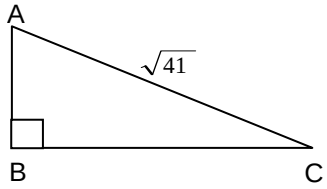
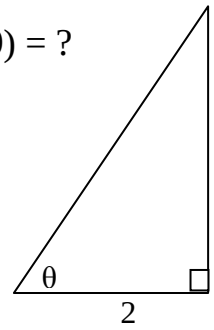
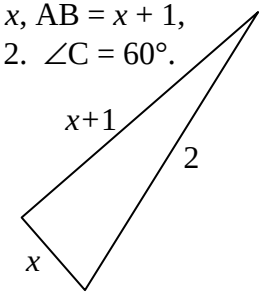
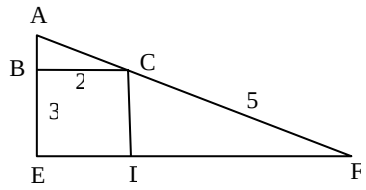
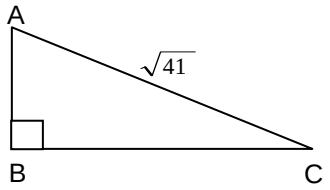
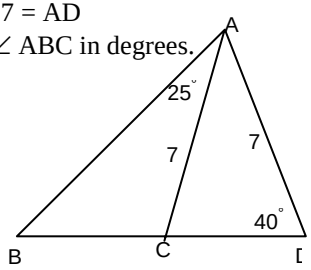
A1 Solve for x. $\sqrt{63+x} = 3+\sqrt{x}$	A2 Find $b > 0$ so that the triangle with vertices (0,0), (b,b), and ($-b$,b) has area 36.	A3 Evaluate cos(60°) + cos(120°) + cos(180°) + cos(240°)+ cos(300°).	A4 Find $x < 0$ such that $(x + 1)^3 = x^3 + 19$.	A5 $\angle$ ABC = 90^0. AC = $\sqrt{41}$. BC = 1 + AB. Find the area of Δ ABC. 
A6 Solve for x: $\frac{4}{2x^{-3} - x^{-2}} = x^3$	A7 $(ln\ 2)x = ln\ 64$ x = ?	A8 (5,0) and (0,15) are the same distance from a point (h,k) on the line $y = 2x$. Find h.	A9 Evaluate $\cot(\tan^{-1}(3))$.	A10 What positive number is 24/5 less than its reciprocal?
A11 $y = \frac{2x}{x+3}$ $x = \frac{4y}{y-1}$ $x \neq 0$ x = ?	A12 Find the area of a square inscribed in a circle of area 16π.	A13 sin(2θ) = ? 	A14 For what positive number k is $x^2 + 8kx + y^2 + 6ky = 0$ the equation of a circle of radius 10?	A15 A trip taking 77 minutes at 36 mph takes how many minutes at 63 mph?
A16 Simplify $\left[\sqrt{2+\sqrt{3}} + \sqrt{2-\sqrt{3}}\right]^2$	A17 The larger root of $x^2 + bx - 12$ is $\frac{b}{2}$ b = ?	A18 $f(x) = \frac{-6}{x}$ Find r if f(r +1) = f(r) +1 and r > 0.	A19 AC = x, AB = x + 1, BC = 2. $\angle$C = 60°. x = ? 	A20 $y = x^2 + 1$ intersects $y = mx$ exactly once. $m > 0$ m = ?

A21 $x = 4y + 12$ $\sqrt{x} = y + 3$ $x \neq 0$ x = ?	A22 What is the largest real number k such that the graphs of $x = k$ and $(x-1)^2 + (y+5)^2 = 9$ intersect?	A23 How long are the sides of an equilateral triangle of area $\sqrt{3}$?	A24 The squares of two consecutive positive integers differ by 2007. Find the sum of the integers.	A25 The lines through (-1,0) and (-2,0) with y-intercept b have slopes that sum to 3. Find b.
A26 For what number a does $ax^2 + 16x + 1 = 0$ have exactly one real root?	A27 Simplify $\log_{10}(2007) + \log_{10}\left(\frac{1}{.2007}\right)$	A28 (1,b) and (1, b-2) lie on perpendicular lines through the origin. Find b.	A29 Find the positive integer n such that $1 + 2 + 3 + \ldots + n = 190$.	A30 BCDE is a rectangle, BC = 2, BE = 3, and CF = 5. Find AC. 
A31 $(3 + 6\sqrt{5})(1 + a\sqrt{5}) = b$ for integers a and b. Find b.	A32 The smallest value of $y = x^2 + 6x + k$ for all x is $y = 7$. Find k.	A33 $(\cos\theta + i\sin\theta)^2 = i$ for $0° < \theta < 90°$ and $i^2 = -1$. Find θ in degrees.	A34 Solve for x: $\lvert x \rvert + 2x + 3 = 0$	A35 For how many integers x does the inequality $\left(x + \frac{5}{2}\right)\left(x - \frac{9}{2}\right) < 0$ hold?
A36 $4^x = 2^x + 56$ x = ?	A37 Solve for x: $\log_{10}(x-7) =$ $3 + \log_{10}(2)$	A38 $\frac{\cos(x)}{2} + \frac{\cos(2x)}{3} = 1$ has how many solutions for x in radians and $0 \leq x < 2\pi$?	A39 $1 + x + x^2 + \ldots$ equals 2. x = ?	A40 Solve for k. $\frac{k^3 + 1}{k^2 - k + 1} = 2007$

2007

B1 Solve for $x > 0$: $\frac{1}{x}+\frac{6}{x+6}=1$	B2 (1,b) and (1, b-2) lie on perpendicular lines through the origin. Find b.	B3 Find the least integer r such that $\frac{54^r \cdot 36}{3^{25}}$ is an integer.	B4 $\angle ABC = 90^0$. AC = $\sqrt{41}$. BC = 1 + AB. Find the area of Δ ABC. 	B5 $1 + x + x^2 + \ldots$ equals 2. x = ?
B6 Find $x < 0$ such that $(x + 1)^3 = x^3 + 19$.	B7 Solve for x: $(x - 64)^4 = x^4$	B8 A trip taking 77 minutes at 36 mph takes how many minutes at 63 mph?	B9 Find the area of a square inscribed in a circle of area 16π.	B10 For what number a does $ax^2 + 16x + 1 = 0$ have exactly one real root?
B11 Solve for x. $\frac{x-1}{x+1}=\frac{5x}{5x+12}$	B12 Find $b > 0$ so that the triangle with vertices (0,0), (b,b), and ($-b$,b) has area 36.	B 13 What positive number is 24/5 less than its reciprocal?	B14 $\angle BAC = 25^\circ, \angle ADC = 40^\circ$. AC = 7 = AD Find $\angle ABC$ in degrees. 	B15 Simplify $9r$ if $r = .77777\ldots$
B16 Simplify $\left[\sqrt{2+\sqrt{3}}+\sqrt{2-\sqrt{3}}\right]^2$	B17 Solve for x: $\lvert x \rvert + 2x + 3 = 0$	B18 The lines through (-1,0) and (-2,0) with y-intercept b have slopes that sum to 3. Find b.	B19 Solve for x: $\frac{4}{2x^{-3}-x^{-2}} = x^3$	B20 $x^2 - y^2 = 2$ $x - y = 2$ x = ?

B21

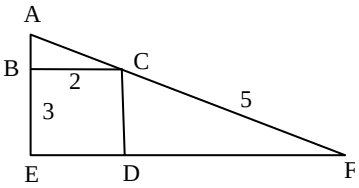
For how many integers x does the inequality

$$\left(x+\frac{5}{2}\right)\left(x-\frac{9}{2}\right)<0$$

hold?

A30

BCDE is a rectangle,
BC = 2, BE = 3, and CF = 5.
Find AC.



B23

$x^2 + y = x + y^2$

$x \neq y$

$x + y = ?$

B24

$4^x = 2^x + 56$

$x = ?$

B25

A = {1,2,3,4},
B = {2,4,6}, and the universe is {1,2,3,4,5,6}.
How many elements are in $\left(A\cap\overline{B}\right)\cup\left(\overline{A}\cap B\right)$, where $\overline{X}$ is the complement of X ?

B26

$$y=\frac{2x}{x+3}\ ,\quad x=\frac{4y}{y-1}$$

$x \neq 0$

$x = ?$

B27

$x = 4y + 12$

$\sqrt{x} = y + 3$

$x \neq 0$

$x = ?$

B28

(5,0) and (0,15) are the same distance from a point (h,k) on the line $y = 2x$.
Find h.

B29

The smallest value of $y = x^2 + 6x + k$ for all x is $y = 7$.
Find k.

B30

What 2-digit number is 8 times the sum of its digits?

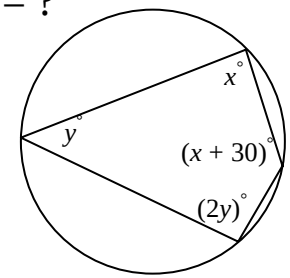
B31

$\left(3+6\sqrt{5}\right)\left(1+a\sqrt{5}\right)=b$

for integers a and b.
Find b.

B32

$x = ?$



B33

The larger root of $x^2 + bx - 12$ is $\frac{b}{2}$

$b = ?$

B34

Write

$$\frac{20!}{21!-20!}$$

in lowest terms, where $n! = n(n\text{-}1)\cdot\cdot\cdot2\cdot1$.

B35

Solve for x.

$$\sqrt{63+x}=3+\sqrt{x}$$

B36

Find the positive integer n such that

$1 + 2 + 3 + ... + n = 190$.

B37

Solve for x.

$100^{x-6} = (.1)^x$

B38

The squares of two consecutive positive integers differ by 2007. Find the sum of the integers.

B39

Solve for k.

$$\frac{k^3+1}{k^2-k+1}=2007$$

B40

For what x does

$$\left(72-2007^{-1}\right)\left(72-\frac{1}{x}\right)^{-1}$$

equal 1?