Christmas Day Task 2022 - A-Level Version

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	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**

	Red	Yellow	Brown	Blue	Black
Answer	2	4	5, 8, 10, 20	3	6, 7, 9, 12, 60, 72

Questions - Solve the equations below and colour the square (pixel) at the indicated coordinate according to the colour table above.

(1,3) Solve $2x + 3 = 7$

(2,2) Solve $4x = 16$

(2,3) The positive solution of the quadratic $x^2 + x - 6 = 0$

(2,4) Solve $\frac{x}{2} = 1$

(3,2) Solve $2x + 3 = 11$

(3,3) Solve $3x - 2 = 10$

(3,4) Solve $2x - 20 = x$

(4,2) Solve $\frac{3x + 2}{2} = 7$

(4,3) Solve $x + 3 = 7$

(4,4) The radius of the circle $x^2 + y^2 = 25$

(4,5) The absolute value of the $y-$intercept of the line $y = 4x - 5$

(5,1) Solve $2x - 1 = 9$

(5,2) Solve $25x = 125$

(5,3) Solve $4x + 3 = 25$

(5,4) The $x-$coordinate of the turning point of the quadratic $y = x^2 - 10x + 28$

(5,5) Where the line $y = 2x - 10$ crosses the $x-$axis (i.e. when $y = 0$)

(5,6) The area of the trapezium with parallel sides of 3cm and 7cm and perpendicular height of 4cm.

(6,1) The area of a triangle with base 2cm and perpendicular height 5cm

(6,2) Solve $3x + 2 = x + 12$

(6,4) The $y-$coordinate of the turning point of the quadratic $y = x^2 - 10x + 28$

(6,5) Find a such that $2^a = 2^3 \times 2^2$

(6,6) Solve $\frac{30}{x} = 6$

(6,7) Solve $\frac{100}{x} = 5$

(7,1) Solve $x - 4 = 1$

(7,2) Solve $4x = 3x + 5$

(7,4) Solve $6x - 2 = 4x + 4$

(7,5) The gradient of the straight line $y = 5x + 2$

(7,7) $\sqrt{25}$

(7,8) Find $\sqrt{64}$

(7,9) Solve $2x - 3 = 7$

(7,10) Solve $7x = 35$

(7,11) Solve $2x - 4 = 6$

(8,1) The gradient of the line $-10x + 2y = 6$

(8,2) Solve $\frac{3x + 9}{3} = 8$

(8,3) The power of x when you simplify $\frac{8x^8y^{12}}{2x^3y^8}$

(8,7) $\sqrt[3]{125}$

(8,8) Find a such that $\sqrt{75} = a\sqrt{b}$

(8,9) Solve $x^4 = 256$

(8,10) Solve $6x + 7 = 3x + 22$

(8,14) $\sqrt[5]{7776}$

(9,1) $\sqrt{100}$

(9,2) Two more than the $x-$intercept of the line $3x + 2y = 9$

(9,3) Find n such that $\left(3^4\right)^5 = 3^n$

(9,4) Solve $x + 2 = 22$

(9,5) The number you want has prime factorisation $2^2 \times 5$

(9,6) $\sqrt{400}$

(9,7) Solve $3x - 3 = 57$

(9,8) The value of $f(3)$ when $f(x) = 3x^2 - 7$

(9,9) Find n such that $3^8 \div 3^5 = 3^n$

(9,10) Solve $\frac{24}{x} = 4$

(9,13) The interior angle of a regular pentagon

(10,1) A triangle has two angles of size $100°$ and $60°$ respectively. What is the size of the other angle?

(10,2) $\sqrt{3^2 + 4^2}$

(10,3) The y solution of the simultaneous equations

$$x + y = 9 \quad \& \quad x + 2y = 14$$

(10,4) Solve $3x = 30$

(10,5) Solve $\frac{x}{2} = 10$

(10,6) Solve $3(x + 2) = 36$

(10,7) Solve $4(x - 3) = x + 27$

(10,8) An isosceles triangle has an angle of $140°$ at the vertex above the base. Find the size of each of the base angles.

(10,9) A quadrilateral has interior angles of $90°$, $120°$ and $78°$. What is the size of the other interior angle?

(10,10) Solve $\frac{x}{2} = 36$

(10,11) Solve $3x + 2 = 20$

(10,12) $\sqrt{13^2 - 5^2}$

(10,13) Find x such that $\sqrt{x} = 2\sqrt{3}$

(11,1) The repeated root of $x^2 - 10x + 25 = 0$

(11,2) Solve $10x = 50$

(11,3) The positive solution of $x^2 - 100 = 0$

(11,4) Solve $4x + 6 = 86$

(11,5) The power of y when you simplify $\frac{8x^8y^{12}}{2x^3y^8}$

(11,6) Find b such that $\sqrt{125} = b\sqrt{b}$

(11,7) Find a such that $\left(b^2\right)^5 = b^a$

(11,8) $\sqrt{144}$

(11,12) The gradient of the line $y = 6x + 5$

(12,4) The $y-$intercept of the line $y = -3x + 5$

(12,5) The x solution of the simultaneous equations

$$x + y = 9 \quad \& \quad x + 2y = 14$$

(12,6) Find a such that $a^3 = 2^6$

(12,7) Solve $6x = 30$

(12,8) Solve $2x - 4 = 12$

(12,9) The fourth prime number

(12,10) Solve $3^2 = x$

(12,12) A pair of values x_1, x_2 such that both indicate the same colour and $x_1 - x_2 = 60$

(12,14) The number of seconds in a minute

(13,5) $x_1 x_2 = 40$ where both x_1 and x_2 indicate the same colour

(13,6) Solve $10x + 7 = 87$

(13,7) Solve $6(x + 3) = 66$

(13,10) Solve $8(x + 3) = 4(x + 12)$

(13,13) The number of degrees in each of the angles in an equilateral triangle

(14,10) Solve $3x = 36 - x$

(14,11) Solve $2x + 3 = 17$

(15,10) Solve $\frac{3x + 7}{2} = 17$

(15,12) The number with prime factorisation $2^2 \times 3 \times 5$