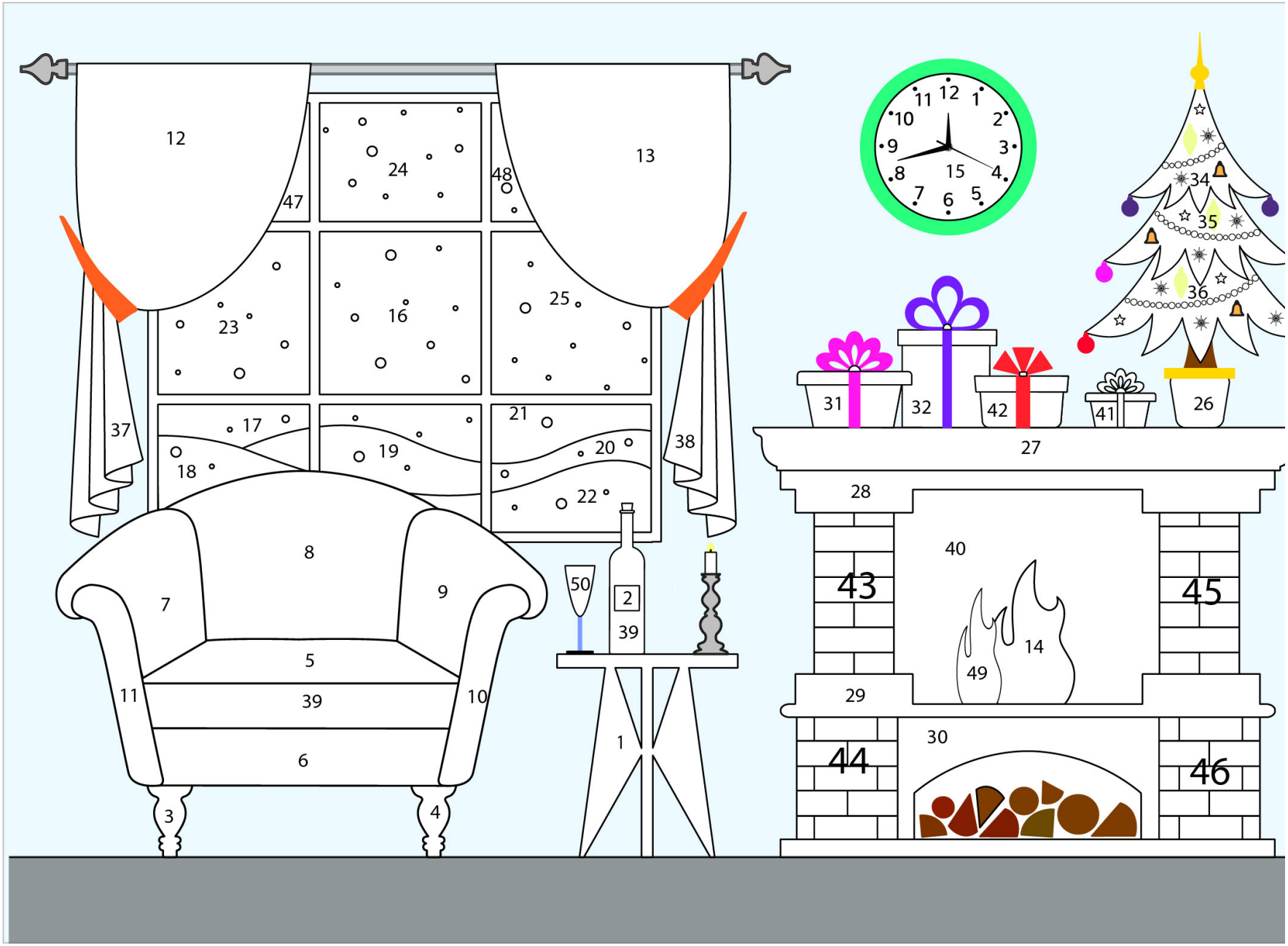
A-Level Christmas Calculated Colouring 2021



Answer	3	4	1	12	25 / 2	36	8	10
Colour	Brown	Yellow	Grey	Blue	Red	Green	Light Green	Orange

1) The absolute value of the product of the gradients of two lines which are perpendicular.

2) Find a such that $\sqrt{a} = 2\sqrt{2}$.

3) The power of z when you simplify $\frac{xz^3}{y^3} \times \frac{x^5y^4}{3x^2z^2}$.

4) The radius of the unit circle.

5) The $x-$ coordinate of the centre of the circle $x^2 - 8x + y^2 + 10y + 16 = 0$.

6) The $x-$coordinate of the turning point of $y = x^2 - 6x + 21$.

7) Find b such that $(x-2)(x+b)^2 = x^3 + 6x^2 - 32$.

8) The remainder on dividing $x^3 + 4x^2 + 3x + 4$ by $(x+1)$.

9) The gradient of the line perpendicular to $y = -\frac{1}{4}x + 3$.

10) Given that $(x+5)$ and $(x-1)$ are factors of the polynomial $x^4 + ax^3 - 15x^2 - 19x + b$, find a.

11) The gradient of the line passing through $(-2, -1)$ and $(0,5)$.

12) One quarter of the discriminant of the quadratic $y = 2x^2 + 8x + 3$.

13) The radius of the circle $x^2 + (y-3)^2 = 100$.

14) The denominator when you rationalise $\frac{7}{\sqrt{10}}$

15) The coefficient of x^2 in the expansion of $(1+3x)^n$ is 252. Find n

16) The $y-$coordinate of the turning point of $y = x^2 - 6x + 21$.

17) The largest root (in absolute value) of the equation $3x^2 - 42x + 72 = 0$.

18) $7776^{\frac{2}{5}}$.

19) Find y such that $2x + 4y = 56$ and $x + y = 20$.

20) The denominator of $\frac{1}{\sqrt{8}}$ when rationalised.

21) $20736^{\frac{1}{4}}$.

22) $2 \times \binom{6}{2} + \binom{4}{2}$ where $\binom{a}{b}$ represents a choose b.

23) The area of the triangle sandwiched between the x and $y-$axes and the line which passes through $(-2,9)$ and $(6, -3)$.

24) Find x such that $2x + 4y = 56$ and $x + y = 20$.

25) Find n such that the coefficient of x^3 in the expansion of $(1+3x)^n$ is 540.

26) The number of intersection points of the graphs for $x^2+y^2=9$ and the equation $y=2x+1$

27) The gradient of the line which is perpendicular to $y=-x+3$.

28) The square of the radius for the circle $x^2+4x+y^2-8y-5=0$.

29) $\sqrt{625}$

30) The $x-$intercept of the straight pin $-x-4y=-1$.

31) Find the coefficient of x^3 in the expansion of $(2+3x)^4$ and then divide it by 18.

32) The power of x when you simplify $\frac{xz^3}{y^3}\times\frac{x^5y^4}{3x^2z^2}$.

33) Bonus question....

34) The point $(x,x+1), \quad x\in\mathbb{Z}^+$ lies on the circle $x^2-10x+y^2-10y+25=0$. Find the y-coordinate for the largest x and then multiply by 4.

35) The highest common factor of 252 and 180

36) Given that $(x+5)$ and $(x-1)$ are factors of the polynomial $p(x)=x^4+ax^3-15x^2-19x+b$, find b and add 6.

37) The solution of $2^x=4^5$.

38) The length of the line segment between $(-5,-1)$ and $(3,5)$.

39) The radius squared of the circle $x^2-8x+y^2+10y+16=0$.

40) The power of 11 in the prime factor decomposition of 1980.

41) $\sqrt{1296}$

42) The $y-$intercept of the line parallel to $-2x+y=12$ which passes through $(-4,4)$.

43) Find a such that $\sqrt{63}=a\sqrt{7}$.

44) Find k such that the point $(7,6)$ lies on the circle $(x-k)^2+(y-k)^2=25$.

45) The intersection point of the line $x+ay=34$ and $y=x+6$ is $(4,10)$. Find a.

46) The repeated root of the polynomial $P(x)=x^3-12x^2+45x-54$.

47) The coefficient when you differentiate $y=4x^3$.

48) One twentieth of the coefficient of x when you expand, by the binomial theorem, $(2+3x)^5$

49) The points $A(-4,-3)$ and $B(4,3)$ is the diameter of a circle. Find the radius squared of this circle.

50) The $y-$intercept of the straight line $25x+6y=150$