SAT Math Practice Questions: Solutions

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1 Algebra Solutions

Question 1: $2x + 3 = 11 \Rightarrow x = 4$ **(B)**

Question 2: $3(x - 2) = 2x + 5 \Rightarrow x = 11$ **(C)**

Question 3: $2x - 7 = 3 \Rightarrow x = 5 \Rightarrow 4x + 5 = 25$ **(B)**

Question 4: $x + y = 7, 2x - y = 3 \Rightarrow x = \frac{10}{3}, y = \frac{11}{3}$ **(D)**

Question 5: $f(x) = 3x + 2 \Rightarrow f(4) = 14$ **(B)**

Question 6: $x^2 - 5x + 6 = (x - 2)(x - 3)$ **(B)**

Question 7: $x^2 - 4x - 5 = 0 \Rightarrow x = 5, -1$ **(B)**

Question 8: $\frac{3}{x} = 6 \Rightarrow x = \frac{1}{2}$ **(A)**

Question 9: $\frac{2x}{3} - \frac{1}{2} = \frac{3}{4} \Rightarrow x = \frac{15}{8}$

Question 10: $\frac{2}{3}x - \frac{1}{4}(6x - 8) = -\frac{5x}{6} + 2$

Question 11: $2(3x - 4) - 5(x - 1) = x - 3$ **(A)**

Question 12: $x^2 - 4x + 3 = 0 \Rightarrow x = 1, 3$ **(A)**

Question 13: $(x + 2)^2 = x^2 + 4x + 4$ **(B)**

Question 14: $\frac{x}{2} + \frac{x}{3} = 5 \Rightarrow x = 6$

Question 15: $4x^2 - 12x + 9 = (2x - 3)^2$

Question 16: $\frac{x^2-9}{x-3} = x + 3$ **(A)**

Question 17: $|2x - 5| = 3 \Rightarrow x = 4, 1$ **(A)**

Question 18: $6x^2 + 11x - 10 = (2x + 5)(3x - 2)$ **(B)**

Question 19: $\frac{2}{x-1} = \frac{4}{x+1} \Rightarrow x = 3$

Question 20: Roots 2, -3: $x^2 + x - 6$

Question 21: $2(x - 3) = 4x + 2 \Rightarrow x = -4$ **(C)**

Question 22: $|3x + 1| = 7 \Rightarrow x = 2, -\frac{8}{3}$ **(A)**

Question 23: $6x^2 + 11x - 35 = (2x + 7)(3x - 5)$ **(A)**

Question 24: $\frac{2x}{x-3} = 4 \Rightarrow x = 6$ **(C)**

Question 25: $x + 2y = 7, 2x - y = 1 \Rightarrow x = \frac{9}{5}, y = \frac{13}{5}$ **(A)**

Question 26: $(x + 3)(2x - 4) = 2x^2 + 2x - 12$ **(A)**

Question 27: $x^2 + 5x + 6 = 0 \Rightarrow x = -2, -3$ **(A)**

Question 28: $\frac{3x}{4} - \frac{2x}{3} = \frac{x}{12}$ **(A)**

Question 29: $\frac{1}{x} + \frac{1}{x+2} = \frac{3}{4} \Rightarrow x = -\frac{4}{3}, 2$

Question 30: $x^3 - 27 = (x - 3)(x^2 + 3x + 9)$

2 Geometry and Trigonometry Solutions

Question 1: $3 \times 4 = 12$ **(B)**

Question 2: Hypotenuse $= 2 \times 5 = 10$ **(B)**

Question 3: $2\pi r = 10\pi \Rightarrow r = 5 \Rightarrow A = 25\pi$ **(A)**

Question 4: $x^2 + y^2 = 25 \Rightarrow \frac{dy}{dx} = -\frac{3}{4}$ at (3,4)

Question 5: $180° - 45° - 60° = 75°$

Question 6: $\pi r^2 = 49\pi \Rightarrow r = 7$ **(B)**

Question 7: $\sin 30° = \frac{\text{opp}}{10} \Rightarrow \text{opp} = 5$ **(A)**

Question 8: Perimeter $= 2(3 + 3) = 12$ **(B)**

Question 9: $3k + 4k + 5k = 180° \Rightarrow 5k = 75°$ **(B)**

Question 10: $\sin\theta = \frac{1}{2} \Rightarrow \theta = 30°$ **(A)**

Question 11: $(x-2)^2 + (y+3)^2 = 16$ **(A)**

Question 12: $5 = 2\theta \Rightarrow \theta = 2.5$ **(A)**

Question 13: $\frac{1}{2} \cdot 8 \cdot 5 = 20$ **(A)**

Question 14: Midpoint $= (1, 2)$

Question 15: $\cos x = \frac{\sqrt{2}}{2} \Rightarrow x = 45°, 315°$

Question 16: $2\pi r = 18\pi \Rightarrow r = 9$ **(A)**

Question 17: $\sqrt{3^2 + 4^2} = 5$ **(A)**

Question 18: Heron's: $s = 12, A \approx 27$ **(B)**

Question 19: Slope $= 2$, $y = 2x - 1$

Question 20: $\tan x = 1 \Rightarrow x = 45°, 225°$

Question 21: $3 \times 4 = 12$ **(B)**

Question 22: Hypotenuse $= 2 \times 5 = 10$ **(B)**

Question 23: $2\pi r = 10\pi \Rightarrow A = 25\pi$ **(A)**

Question 24: Slope $= -\frac{3}{4}$ (same as Q4)

Question 25: $75°$ (same as Q5)

Question 26: $\pi \cdot 7^2 = 49\pi$ **(A)**

Question 27: $\pi \cdot 10 = 10\pi$ **(A)**

Question 28: Hypotenuse $= 2 \cdot 6 = 12$ **(C)**

Question 29: $\frac{80^\circ}{2} = 40^\circ$ **(A)**

Question 30: $\sin 45^\circ = \frac{\sqrt{2}}{2}$ **(A)**

Question 31: $\cos 60^\circ = \frac{1}{2}$ **(A)**

Question 32: $\sqrt{3^2 + 4^2} = 5$ **(A)**

Question 33: Side $= 10$ **(B)**

Question 34: $\frac{120^\circ}{2} = 60^\circ$

Question 35: $\cos 37^\circ \approx 0.8 \Rightarrow h = 10$

3 Problem Solving and Data Analysis Solutions

Question 1: $0.3 \cdot 120 = 36$ **(A)**

Question 2: $5 \cdot 12 = 60$ **(A)**

Question 3: $0.4 \cdot 200 = 80$ **(A)**

Question 4: $\frac{2}{3} \cdot 15 = 10$ **(C)**

Question 5: $\frac{150}{3} = 50$ mph **(A)**

Question 6: $1 - \frac{3}{8} = \frac{5}{8}$ **(A)**

Question 7: $1.2 \cdot 0.8 = 0.96 \Rightarrow 4\%$ decrease **(B)**

Question 8: $2(2w + w) = 36 \Rightarrow w = 6, A = 72$ **(C)**

Question 9: $\frac{7}{20}$

Question 10: Median $= 3$

Question 11: Middle value $= 8$ **(B)**

Question 12: $\frac{5}{10} = \frac{1}{2}$ **(A)**

Question 13: $y = 2(4) + 1 = 9$ **(C)**

Question 14: Mean $= 7.4$, SD ≈ 1.62

Question 15: $40 - (18 + 15 - 5) = 12$

Question 16: $0.7 \cdot 50 = 35$ **(B)**

Question 17: Mode $= 3$ **(B)**

Question 18: $\frac{5}{10} = \frac{1}{2}$ **(A)**

Question 19: Range $= 7$, IQR $= 5$

Question 20: Weighted average $= 81.5$

Question 21: $12 \cdot \frac{8}{5} = 19.20$ **(A)**

Question 22: $\frac{2}{3} \cdot 9 = 6$ **(C)**

Question 23: $\binom{8}{4} \left(\frac{1}{2}\right)^8$ **(A)**

Question 24: $60 \cdot 2.5 = 150$ **(C)**

Question 25: $0.75x = 45 \Rightarrow x = 60$ **(C)**

Question 26: $300 - 0.6 \cdot 300 = 120$ **(C)**

Question 27: $90 - (16 + 20 + 15 + 22) = 17$ **(A)**

Question 28: $w = 6, l = 12 \Rightarrow A = 72$ **(C)**

Question 29: Median $= 6$

Question 30: Range $= 100$, Mean $= 200$

4 Advanced Math Solutions

Question 1: $x^2 - 2x - 8 = 0 \Rightarrow x = 4, -2$ **(B)**

Question 2: $f(2) = 2(4) - 3(2) + 1 = 3$ **(A)**

Question 3: $\sqrt{2x+5} = 3 \Rightarrow x = 2$ **(B)**

Question 4: $16^{\frac{3}{4}} = 8$ **(C)**

Question 5: $\frac{3x^2-12}{3} = x^2 - 4 = (x-2)(x+2)$ **(D)**

Question 6: $2x - 5 < 3 \Rightarrow x < 4$ **(B)**

Question 7: Horizontal asymptote: $y = 0$ **(B)**

Question 8: $\log_2(32) = 5$ **(B)**

Question 9: $f^{-1}(x) = \frac{2x+1}{3}$

Question 10: $\frac{1}{1+\frac{1}{x}} = \frac{x}{x+1}$

Question 11: $(x+3)^2 = 0 \Rightarrow x = -3$ **(A)**

Question 12: $(2x^3)^2 = 4x^6$ **(B)**

Question 13: Vertex: $(2, 0)$ **(A)**

Question 14: $f'(x) = 6x - 2$

Question 15: $e^x = 5 \Rightarrow x = \ln 5$

Question 16: $(x-3)^2 = 0 \Rightarrow x = 3$ **(A)**

Question 17: $(3x^2)^2 = 9x^4$ **(A)**

Question 18: Vertex: $(2, 0)$ **(A)**

Question 19: $f'(x) = 12x^2 - 4x + 1$

Question 20: $2^x = 7 \Rightarrow x = \log_2 7$

Question 21: $(2x+1)(x-3) = 0 \Rightarrow x = -\frac{1}{2}, 3$ **(A)**

Question 22: $\log_3(81) = 4$ **(B)**

Question 23: $16^{\frac{3}{4}} = 8$ **(A)**

Question 24: $\frac{2}{3x^{-2}} = \frac{2x^2}{3}$ **(A)**

Question 25: $f^{-1}(x) = \frac{5x-3}{2}$ **(A)**

Question 26: $f'(x) = 9x^2 - 4$ **(A)**

Question 27: $e^x = 20 \Rightarrow x = \ln 20$ **(A)**

Question 28: $\frac{1}{\sqrt{50}} = \frac{\sqrt{2}}{5}$ **(B)**

Question 29: $\log_2(x-1)(x+3) = 3 \Rightarrow x = 3$

Question 30: $f''(x) = 12x^2 - 12x$