

Applied Math for Manufacturing Assessment - Worked Solutions

Part 1: Fractions, Decimals, Percentages

- 1) $7/16 = 7 \div 16 = 0.4375$
- 2) $0.875 = 875/1000 = 35/40 = 7/8$
- 3) $5.25 - 3.875 = 1.375$
- 4) $1/4 + 3/8 = 2/8 + 3/8 = 5/8 = 0.625$
- 5) $5.25 - 4.75 = 0.50$ inches
- 6) $80 \times (1 - 0.15) = 80 \times 0.85 = 68$ Ra
- 7) Spec = 1.495-1.505, measured = 1.493 \rightarrow Not in spec
- 8) $8/400 = 0.02 = 2\%$ defective

Part 2: Measurement & Conversion

- 9) $152.4 \div 25.4 = 6.000$ inches
- 10) $3.75 \times 25.4 = 95.25$ mm
- 11) $2 \frac{1}{8} = 2.125$ inches
- 12) $105 \div 25.4 = 4.134$ inches
- 13) $5 \div 8 = 0.625$ inches
- 14) $0.3125 = 5/16$
- 15) Range = $4.000 \pm 0.003 = 3.997"$ to $4.003"$
- 16) $V = 6.5 \times 3.75 \times 2 = 48.75$ in³

Part 3: Geometry & Trigonometry

- 17) $A = 8.5 \times 2.5 = 21.25$ in²
- 18) $A = 1/2 \times 4 \times 6 = 12$ in²
- 19) $C = \pi d = 3.14 \times 6 = 18.84"$
- 20) Hyp = $\sqrt{(5^2 + 12^2)} = \sqrt{169} = 13"$
- 21) $r = C / (2\pi) = 31.4 / 6.28 = 5"$
- 22) $A = \pi r^2 = 3.14 \times 1.5^2 = 7.065$ in²
- 23) Hyp = $\sqrt{(6^2 + 10^2)} = \sqrt{136} = 11.662"$
- 24) Hyp = $10 / \cos 20^\circ = 10 / 0.94 = 10.64$ ft

Part 4: Algebra & Formulas

- 25) $5x - 10 = 20 \rightarrow 5x = 30 \rightarrow x = 6$
- 26) $3(x + 4) = 27 \rightarrow x + 4 = 9 \rightarrow x = 5$
- 27) $RPM = (12 \times 400) / (\pi \times 1.5) = 4800 / 4.71 = 1019$ RPM
- 28) $T = F \times D = 150 \times 2 = 300$ lb.ft
- 29) Feed = $1200 \times 0.005 \times 4 = 24$ in/min
- 30) $3x - 5 = 25 \rightarrow 3x = 30 \rightarrow x = 10$
- 31) Time = $800 \div 2400 = 0.333$ min = 20 sec
- 32) $SA = 2\pi r^2 + 2\pi rh = 14.13 + 37.68 = 51.81$ in²

Part 5: Word Problems

- 33) 3 hrs = 10800 sec; $10800 \div 36 = 300$ parts
- 34) $300 \times 0.42 = 126$ lb
- 35) $1200 \div 18 = 66$ full products
- 36) $90 + 60 + 150 = 300$ sec = 5 min

Final Page

- 37) 80 ft = 960 in; $960 - 624 = 336$ in excess
- 38) 40 hr = 5 shifts; $1.5 \times 5 = 7.5$ gal
- 39) $1000 \div 10$ hr = 100 parts/hr
- 40) $3750 \div 500 = 7.5 \rightarrow 8$ taps required