

# 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 → 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)  $V = 6.5 \times 3.75 \times 2 = 48.75$  in<sup>3</sup>

## Part 3: Geometry & Trigonometry

- 17)  $A = 8.5 \times 2.5 = 21.25$  in<sup>2</sup>
- 18)  $A = 1/2 \times 4 \times 6 = 12$  in<sup>2</sup>
- 19)  $C = \pi d = 3.14 \times 6 = 18.84$ "
- 20)  $\text{Hyp} = \sqrt{(5^2 + 12^2)} = \sqrt{169} = 13$ "
- 21)  $r = C / (2\pi) = 31.4 / 6.28 = 5$ "
- 22)  $A = \pi r^2 = 3.14 \times 1.5^2 = 7.065$  in<sup>2</sup>
- 23)  $\text{Hyp} = \sqrt{(6^2 + 10^2)} = \sqrt{136} = 11.662$ "
- 24)  $\text{Hyp} = 10 / \cos 20^\circ = 10 / 0.94 = 10.64$  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 × 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 =  $2\pi r^2 + 2\pi rh = 14.13 + 37.68 = 51.81$  in<sup>2</sup>

## 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