

5 300 minutes = 5 hours

6 a Numbers ending in zero are multiples of 10. $10 = 2 \times 5$ b 4 c $2^5 \times 9 \times 5^5 = 900\,000 = 9 \times 10^5$

7 a $2^8 \times 5^9$ b $2^7 \times 3^6$ c $2^6 \times 3^5 \times 5^7$ d $2^{10} \times 3^9 \times 5^7$

8 625

9 a i 120536 km ii 1.20536×10^5 km b i 227900000000 m ii 2.279×10^{11} m

c i 0.000004 m ii 4×10^{-6} m d i 0.000000001 m ii 1×10^{-10} m

10 a 11881376 b 4084101

11 1.7962×10^8 kg

12 a $\frac{7\sqrt{2}}{2}$ b $\frac{\sqrt{2}}{6}$

13 $\frac{\sqrt{3}}{3}$

14 One course: $5 + 7 + 3 = 15$
Two courses: $35 + 15 + 21 = 71$
Three courses: 105
Total: $15 + 71 + 105 = 191$

15 a 9000000 b 800 c 0.000008

16 a 20 b 3 c 19 d 3 e 2 f 2

1 Unit test

1 a 2 multiplications with an answer of 33.642 e.g. 62.3×0.54 and 0.623×54 [1 each]

b 1 division with an answer of 0.623 e.g. $33.642 \div 54$ [1]

2 Students show work to approximately evaluate $3.2^2 \approx 10$ or 11 [1]

Students show work to approximately evaluate $\sqrt{69} \approx 8.5$ [1]

Correct order: $\sqrt[3]{27}, \sqrt{69}, 3.22, 13.74$ [1]

3 a 48 [1] b 46.2 [1]

4 a $2 \times 3 \times 7$ [1]

b $84 = 2 \times 2 \times 3 \times 7 = 2^2 \times 3 \times 7$ [1]

$84^3 = 2^6 \times 3^3 \times 7^3$ [2] [1 for attempting to cube $22 \times 3 \times 7$]

5 HCF = 15, LCM = 150 [3]

[-1 for incorrect HCF, -2 for incorrect LCM]

6 1:15pm [2] [1 for 225 (or 3h 45min)]

7 a $a = 6$ [1] b $a = 3$ [1] c $a = 2$ [1]

8 3^{32} [1]

9 $18 = 2 \times 3 \times 3$ [1]

$2520 = 2 \times 3 \times 3 \times 140$ and the conclusion 'Yes'. [1]

10 a 6.5×10^{-7} [1] b 9×10^5 [1] c 3.2×10^9 [1]

11 $\frac{9}{16}$ [2]

12 a 6.8×10^5 [1] b 5.2×10^5 [1] c 4.8×10^{10} [1] d 1.3×10^{-1} [1]

13 $3^{36} = 3^{3x}$ or $36 = 3x$ [1] $x = 12$ [1]

14 $15\sqrt{6}$ units² [3] [1 for $\sqrt{45} \times \sqrt{30}$, 1 for $3 \times \sqrt{5} \times \sqrt{2} \times \sqrt{3} \times \sqrt{5}$]

15 Understanding that the first digit will have 9 possibilities and/or the last digit will have 5 possibilities.

$9 \times 10 \times 10 \times 5$ [2] 4500 [1]

16 $\frac{8\sqrt{6}}{6}$ [1] $\frac{4\sqrt{6}}{3}$ [1]

Sample student answer

The student has not used her answer to conclude whether or not the 500 sheets of paper will fit in the printer.