

1.

$$\begin{aligned}
 1.1 \quad \frac{5}{2} - \frac{7}{2} \times \frac{3}{5} &= \frac{5}{2} - \frac{21}{10} = \frac{5(\times 5)}{2(\times 5)} - \frac{21}{10} = \\
 &= \frac{25}{10} - \frac{21}{10} = \\
 &= \frac{4(:2)}{10(:2)} = \\
 &= \frac{2}{5}
 \end{aligned}$$

$$\begin{aligned}
 1.2 \quad \frac{5}{4} : \frac{3}{2} + \frac{2}{3} &= \frac{5}{4} \times \frac{2}{3} + \frac{2}{3} = \frac{10}{12} + \frac{2(\times 4)}{3(\times 4)} = \\
 &= \frac{10}{12} + \frac{8}{12} = \\
 &= \frac{18(:6)}{12(:6)} = \\
 &= \frac{3}{2}
 \end{aligned}$$

$$\begin{aligned}
 1.3 \quad 1 - \left(\frac{1}{2} : \frac{5}{3} - 0,2\right) \times 6 &= 1 - \left(\frac{1}{2} \times \frac{3}{5} - \frac{2}{10}\right) \times 6 = \\
 &= 1 - \left(\frac{3}{10} - \frac{2}{10}\right) \times 6 = \\
 &= 1 - \frac{1}{10} \times 6 = \\
 &= \frac{1(\times 10)}{1(\times 10)} - \frac{6}{10} = \\
 &= 1 - \frac{6}{10} = \\
 &= \frac{10}{10} - \frac{6}{10} = \\
 &= \frac{4(:2)}{10(:2)} = \\
 &= \frac{2}{5}
 \end{aligned}$$

$$\begin{aligned}
 1.4 \quad \frac{7}{4} : \frac{3}{2} - \left(\frac{2(\times 2)}{3(\times 2)} + \frac{1(\times 3)}{2(\times 3)}\right) &= \frac{7 \times 2}{4 \times 3} - \left(\frac{4}{6} + \frac{3}{6}\right) = \\
 &= \frac{14}{12} - \frac{7(\times 2)}{6(\times 2)} = \\
 &= \frac{14}{12} - \frac{14}{12} = \\
 &= 0
 \end{aligned}$$

2. Total de sumo comprado pela Fátima: $4 \times 1\frac{1}{2} = 4 \times \frac{3}{2} = \frac{12}{2} = 6 \text{ l}$

Número de copos cheios de sumo: $6 : \frac{1}{5} = 6 \times 5 = 30$

A Fátima conseguirá encher 30 copos de sumo.

3. Opção [B]

$$\begin{aligned} \frac{1}{2} : \frac{3}{5} - \frac{1}{2} \times \frac{3}{2} &= \frac{1}{2} \times \frac{5}{3} - \frac{3}{4} = \frac{5(\times 2)}{6(\times 2)} - \frac{3(\times 3)}{4(\times 3)} = \\ &= \frac{10}{12} - \frac{9}{12} = \\ &= \frac{1}{12} \end{aligned}$$

O inverso de $\frac{1}{12}$ é 12.

4. Moedas portuguesas: $\frac{1}{4} \times 360 = \frac{360}{4} = 90$

Moedas espanholas: $\frac{1}{3} \times 360 = \frac{360}{3} = 120$

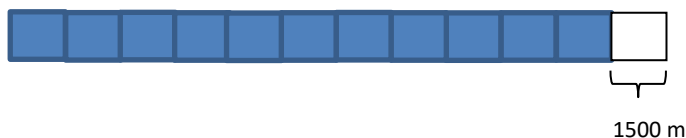
Restantes moedas: $360 - (90 + 120) = 360 - 210 = 150$

Moedas francesas: $\frac{2}{5} \times 150 = \frac{300}{5} = 60$

O Hugo tem 60 moedas francesas.

5. Parte do percurso feito pelo Fernando de bicicleta e a correr: $\frac{1(\times 3)}{4(\times 3)} + \frac{2(\times 4)}{3(\times 4)} = \frac{3}{12} + \frac{8}{12} = \frac{11}{12}$

Parte do percurso a nadar: $\frac{12}{12} - \frac{11}{12} = \frac{1}{12}$



O Fernando percorreu no total $12 \times 1500 = 18\,000\text{m} = 18\text{ km}$.

6.

6.1 $3^4 \times 3 \times 3^2 = 3^{4+1+2} = 3^7$

6.2 $8^2 \times 2 : 4^2 = (2^3)^2 \times 2 : (2^2)^2 = 2^6 \times 2 : 2^4 = 2^7 : 2^4 = 2^3$

7.

7.1 Figura A

$26^3 : 13^3 = 2^3\text{ cm}$

$2^2 \times 2 = 2^3\text{ cm}$

$A_A = l \times l = 2^3 \times 2^3 = 2^6 = 64\text{ cm}^2$

7.2 Figura B

$$c = 2^4 \times 3^4 : 6^2 = 6^4 : 6^2 = 6^2 \text{ cm}$$

$$l = 3^2 \times 4^2 : 6^2 = 12^2 : 6^2 = 2^2 \text{ cm}$$

$$A_B = c \times l = 6^2 \times 2^2 = 12^2 = 144 \text{ cm}^2$$

Figura C

$$b = 6^3 \times 6^2 : 3^5 = 6^5 : 3^5 = 2^5 \text{ cm}$$

$$h = 18^9 : 18^6 : 9^3 = 18^3 : 9^3 = 2^3 \text{ cm}$$

$$A_C = \frac{b \times h}{2} = \frac{2^5 \times 2^3}{2} = \frac{2^8}{2} = 2^7 = 128 \text{ cm}^2$$

O polígono C tem o dobro da área do polígono A ($2 \times 64 = 128$).

8. Opção [D]

$$4^{3^2} \times 4 : (4^2)^3 = 4^9 \times 4 : 4^6 = 4^{10} : 4^6 = 4^4$$

9. Opção [B]

$$\text{Base do paralelogramo: } \frac{1}{\left(\frac{2}{3}\right)^2 : \left(\frac{1}{3}\right)^2} = \frac{1}{\left(\frac{2}{3}\right)^2 \times \left(\frac{3}{1}\right)^2} = \frac{1}{\left(\frac{6}{3}\right)^2} = \frac{1}{2^2} = \frac{1}{4} \text{ cm}$$

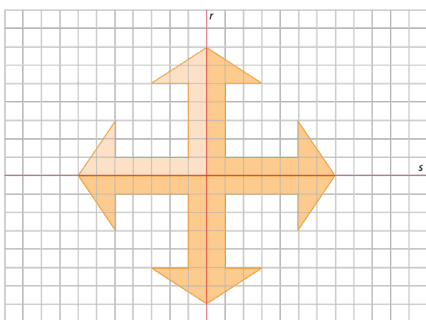
$$\text{Altura do paralelogramo: } \frac{3}{8} - \left(\frac{1}{2}\right)^2 \times \frac{1}{2} = \frac{3}{8} - \left(\frac{1}{2}\right)^3 = \frac{3}{8} - \frac{1}{8} = \frac{2}{8} \stackrel{(:2)}{=} \frac{1}{4} \text{ cm}$$

$$\text{Área do paralelogramo: } A = b \times h = \frac{1}{4} \times \frac{1}{4} = \frac{1}{16} = \frac{1}{2 \times 2 \times 2 \times 2} = \left(\frac{1}{2}\right)^4 \text{ cm}^2$$

$$\begin{aligned} 10. \left(\frac{5}{3} - 1\right)^4 : \left(\frac{2}{3}\right)^3 - \left(\frac{1}{2}\right)^2 \times 2 &= \left(\frac{5}{3} - \frac{3}{3}\right)^4 : \left(\frac{2}{3}\right)^3 - \left(\frac{1}{2}\right)^2 \times 2 = \\ &= \left(\frac{2}{3}\right)^4 : \left(\frac{2}{3}\right)^3 - \left(\frac{1}{2}\right)^2 \times 2 = \\ &= \frac{2}{3} - \frac{1}{4} \times 2 = \\ &= \frac{2(\times 4)}{3(\times 4)} - \frac{2(\times 3)}{4(\times 3)} = \\ &= \frac{8}{12} - \frac{6}{12} = \\ &= \frac{2}{12} \stackrel{(:2)}{=} \frac{1}{6} \end{aligned}$$

11. Opção [B]

12.



13.

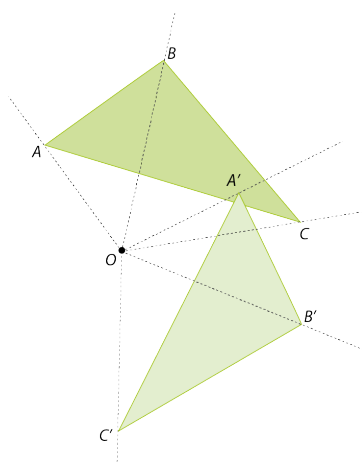
13.1 $A\hat{O}B = 360^\circ : 5 = 72^\circ$

13.2

a) É o ponto *B*. b) É o ponto *D*.

13.3 É o ponto *C*.

14.



15. Opção [B]

$$360^\circ - 150^\circ = 210^\circ$$

16.

16.1 As figuras A, C, D, E, F e H.

16.2 As figuras B, D, E, F e H.

16.3 As figuras D, E, F e H.