

## E Summer Trials Practice 1

1. Without a calculator, evaluate  $\frac{1}{3} - \frac{4}{7} \div 3\frac{1}{2}$ .  $\frac{25}{147}$
2. Without a calculator, write down the value of
- (a)  $49^{\frac{1}{2}}$ . 7
- (b)  $36^0$ . 1
- (c)  $64^{-\frac{2}{3}}$ .  $\frac{1}{16}$
- (d)  $(\frac{2}{3})^{-3}$ .  $\frac{27}{8}$
3. Solve  $4 \times 2^{x+4} = \frac{1}{8^{1-x}}$ .  $x = \frac{9}{2}$
4. Simplify  $\frac{5x^2+5x-30}{10x^2-40}$ .  $\frac{x+3}{2x+4}$
5. Combine and simplify  $\frac{4}{2x+8} - \frac{1}{3x+12}$ .  $\frac{5}{3x+12}$
6. Combine and simplify  $\frac{3}{x} - \frac{5}{x^2+x}$ .  $\frac{3x-2}{x(x+1)}$
7. Simplify  $\frac{4}{\sqrt{8}}$ .  $\sqrt{2}$
8. Simplify  $\frac{1+\sqrt{5}}{2-\sqrt{5}}$ .  $-7 - 3\sqrt{5}$
9. Expand and simplify  $(3 - 5\sqrt{2})^2 - (5 + 2\sqrt{2})(7 - \sqrt{2})$ .  $28 - 39\sqrt{2}$
10. A triangle has sides 7 cm, 8 cm and 13 cm.
- (a) Find the largest angle in the triangle.  $120^\circ$
- (b) Find the area of the triangle. 24.2
11. Sketch the region given by  $x > 1$ ,  $y > 1$ ,  $x + y > 6$ . Shade the region which is satisfied by all three inequalities.
12. Find the three inequalities that describe the triangle with vertices (0, 3), (-3, 0) and (0, -6).  $y < x + 3, y > -2x - 6, x < 0$
13. Solve  $\frac{2}{x} + \frac{6}{x+1} = 3$ .  $x = 2$  or  $x = -\frac{1}{3}$
14. Solve  $10\pi x^2 + 45\pi = 45\pi x$ .  $x = 3$  or  $x = \frac{3}{2}$
15. Two boxes of cereal are mathematically similar. The height of the smaller one is 12 cm. The height of the larger one is 20 cm. If the volume of the larger one is  $200 \text{ cm}^3$ , find the volume of the smaller one. 43.2
16. Two statues are mathematically similar. The SA of the smaller one is  $60 \text{ cm}^2$ . The SA of the larger one is  $86.4 \text{ cm}^2$ . If the volume of the smaller one is  $1000 \text{ cm}^3$ , find the volume of the larger one. 1728
17. Find the inverse of the function  $f(x) = \frac{x-3}{2x+7}$ .  $f^{-1}(x) = \frac{7x+3}{1-2x}$
18. Given  $f(x) = 2 - 3x$  and  $g(x) = \frac{2x}{3-x}$ , find
- (a)  $fg(2)$ . -10

(b)  $gf(2)$ .

(c)  $ff(x)$ .

(d)  $gg(x + 1)$ .

$$\frac{-8}{7}$$

$$9x - 4$$

$$\frac{4(x+1)}{4-5x}$$