Test yourself 1

1. Convert
   (a) 0.45 to a fraction
   (b) 14% to a decimal
   (c) $\frac{5}{8}$ to a decimal
   (d) 78.5% to a fraction
   (e) 0.012 to a percentage
   (f) $\frac{11}{15}$ to a percentage

2. Evaluate as a fraction
   (a) 7^{-2}
   (b) 5^{-1}
   (c) $9^{-\frac{1}{2}}$

3. Evaluate correct to 3 significant figures
   (a) $\sqrt{4.5^2 + 7.6^2}$
   (b) $4.3^{0.3}$
   (c) $\frac{2}{\sqrt[3]{5.7}}$
   (d) $\frac{1.3 \times 10^9}{3.8 \times 10^6}$
   (e) $6^{-\frac{2}{3}}$

4. Simplify
   (a) $\sqrt{32}$
   (b) $2\sqrt{44}$

5. Evaluate
   (a) $|-3| - |2|$
   (b) $|4 - 5|$

6. Evaluate
   (a) $7 + 4 \times 8$
   (b) $[(3 + 2) \times (5 - 1) - 4] \div 8$
   (c) $-4 + 3 - 9$
   (d) $-2 - {}^{-}1$
   (e) $-24 \div -6$

7. Simplify
   (a) $x^5 \times x^7 \div x^3$
   (b) $(5y^3)^2$
   (c) $\frac{(a^5)^4 b^7}{a^9 b}$
   (d) $\left(\frac{2x^6}{3}\right)^3$
   (e) $\left(\frac{ab^4}{a^5 b^6}\right)^0$

8. Evaluate
   (a) $1\frac{3}{5} - \frac{7}{8}$
   (b) $\frac{6}{7} \times 3\frac{2}{3}$
   (c) $9 \div \frac{3}{4}$
   (d) $\frac{2}{5} + 2\frac{1}{10}$
   (e) $15 \times \frac{5}{6}$

9. If $a = \left(\frac{1}{3}\right)^4$ and $b = \frac{3}{4}$, evaluate ab^3 as a fraction.

10. Increase 650 mL by 6%.

11. Johan spends $\frac{1}{3}$ of his 24-hour day sleeping and $\frac{1}{4}$ at work.
   (a) How many hours does Johan spend at work?
   (b) What fraction of his day is spent at work or sleeping?
   (c) If he spends 3 hours watching TV, what fraction of the day is this?
   (d) What percentage of the day does he spend sleeping?

12. The price of a car increased by 12%. If the car cost $34 500 previously, what is its new price?

13. Rachel scored 56 out of 80 for a maths test. What percentage did she score?

14. Evaluate 21^{18}, and write your answer in scientific notation correct to 1 decimal place.

15. Write in index form
   (a) $\sqrt{x}$
   (b) $\frac{1}{y}$
   (c) $\sqrt[6]{x + 3}$
   (d) $\frac{1}{(2x - 3)^{11}}$
   (e) $\sqrt[3]{y^7}$

16. Write in scientific notation
   (a) 0.000 013
   (b) 123 000 000 000

17. Convert to a fraction
   (a) $0.\dot{7}$
   (b) $0.1\dot{2}\dot{4}$

18. Write without the negative index
   (a) x^{-3}
   (b) $(2a + 5)^{-1}$
   (c) $\left(\frac{a}{b}\right)^{-5}$

19. The number of people attending a football match increased by 4% from last week. If there were 15 080 people at the match this week, how many attended last week?

20. Show that $|a + b| \leq |a| + |b|$ when $a = -2$ and $b = -5$.

ANSWERS TO TEST YOURSELF 1

1. (a) $\frac{9}{20}$ (b) 0.14 (c) 0.625 (d) $\frac{157}{200}$ (e) 1.2% (f) 73.3% 2. (a) $\frac{1}{49}$ (b) $\frac{1}{5}$ (c) $\frac{1}{3}$ 3. (a) 8.83 (b) 1.55 (c) 1.12 (d) 342 (e) 0.303 4. (a) $4\sqrt{2}$ (b) $4\sqrt{11}$ 5. (a) 1 (b) 1 6. (a) 39 (b) 2 (c) −10 (d) −1 (e) 4 7. (a) x^9 (b) $25y^6$ (c) $a^{11}b^6$ (d) $\frac{8x^{18}}{27}$ (e) 1 8. (a) $\frac{29}{40}$ (b) $3\frac{1}{7}$ (c) 12 (d) $2\frac{1}{2}$ (e) $12\frac{1}{2}$ 9. $\frac{1}{192}$ 10. 689 mL 11. (a) 6 h (b) $\frac{7}{12}$ (c) $\frac{1}{8}$ (d) 33.3% 12. $38 640 13. 70% 14. 6.3×10^{23} 15. (a) $x^{\frac{1}{2}}$ (b) y^{-1} (c) $(x + 3)^{\frac{1}{6}}$ (d) $(2x - 3)^{-11}$ (e) $y^{\frac{7}{3}}$ 16. (a) 1.3×10^{-5} (b) 1.23×10^{11} 17. (a) $\frac{7}{9}$