

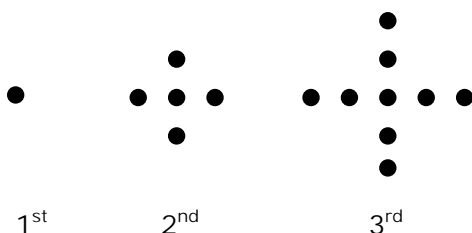
New Elementary Mathematics 1

This test covers material taught in New Elementary Mathematics 1

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Calculators should not be used unless indicated.

1. The highest common factor and lowest common multiple of 2 numbers are 8 and 408 respectively. If one of the numbers is 24, find the other number. [3]
2. The diagram shows the first three patterns of dots in a sequence.



- (a) How many dots are there in the 5th pattern? [1]
 - (b) Which pattern in the sequence contains 197 dots? [2]
3. Evaluate:
 - (a) $2\frac{3}{4} \times 1\frac{3}{22} - 1\frac{5}{6} + 2\frac{3}{5} \div 1\frac{3}{10}$ [2]
 - (b) $(\sqrt{144} - 2^2 + \sqrt[3]{125} \div 3) - ((\sqrt{64} + 12) \div 3)$ [2]
 4. Estimate, correct to 1 significant figure, the value of
$$\frac{9.2048 - 7.8927}{\sqrt[3]{998.23}}$$
 [2]
 5. Express:
 - (a) 0.056 75 correct to 3 decimal places. [1]
 - (b) 4.952 correct to 2 significant figures. [1]
 6. Use a calculator to evaluate the following, giving your answer correct to 2 decimal places if it is not exact.
$$\sqrt{\frac{46.3^2 + 85.9^2 - 70.7^2}{2 \times 46.3 \times 85.9}}$$
 [2]

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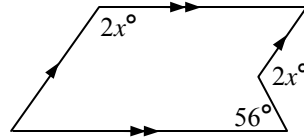
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7. Sara has 45 conch and abalone shells in her collection. 35 of them are large. $\frac{4}{5}$ of the conch shells and 0.75 of the abalone shells are large. How many of the large shells are conch shells? [3]
8. Which of the following are rational numbers?
 $0.7272\dots$; $-\sqrt{64}$; $-\pi$; $\frac{22}{7}$; $\sqrt{8}$; $\sqrt[3]{\frac{125}{27}}$; $\sqrt{\frac{1}{2}}$ [2]
9. Evaluate:
 (a) $(-105) + 27 \times (-8) - 144 \div (-9)$ [2]
 (b) $\{[(54 - 39) \div (-5) + 7] \times (-3) + (-6)\} - (-3 + 1)$ [2]
 (c) $(-2)^2 \times (-5) - 2 \times (-5)^2 - (-3)^3$ [2]
10. Simplify:
 (a) $2(a + b) - 5(a + 2b)$ [2]
 (b) $\frac{2(4x - y)}{8} - \frac{3x - 7y}{16}$ [2]
11. Factorize:
 (a) $3a + 24ay$ [1]
 (b) $2ax - 6bx + 24by - 8ay$ [1]
12. Solve the following equations:
 (a) $5(3x - 2) - 7(x - 1) = 13$ [2]
 (b) $\frac{x}{3} - \frac{7(x - 2)}{9} = 4 - \frac{2x - 4}{6}$ [2]
13. Peter is 8 years younger than Alex. In 9 years' time, the sum of their ages will be 76. How old is Alex now? [2]
14. The sum of three numbers is 109. The second number is 4 times the first and the third is 8 less than the second. Find the three numbers. [2]
15. 8 workers can paint a building in 24 days. How many days will 18 workers take to paint the same building? [3]
16. The cost of fish has increased in the ratio of 9 : 7. If the original cost was \$5.60 per kg, what is the new price? [2]

17. Dried flakes of apple, banana, and apricot are mixed in the ratio 2 : 3 : 5 respectively by weight, to form a dried fruit mix. If the total weight of the mix is 150 g, what is the weight of each type of fruit in the mix? [3]
18. John spent \$4 less than 60% of his money on a book and \$3 more than 75% of his remaining money on another book. He still has \$2 left. What percentage of his original money did he spend? [4]
19. A car travels from village *A* to village *D* via village *B* and village *C*. The distances *AB*, *BC*, and *CD* are in the ratio 2 : 5 : 4 and the times taken to travel these distances are in the ratio 4 : 7 : 6. Given that the time taken for the whole journey is $3\frac{2}{5}$ hours and that village *B* is 42 km away from village *A*, calculate the following:
- (a) The times taken to travel distances *AB*, *BC* and *C*, in minutes. [1]
- (b) The distances *BC* and *CD*. [1]
- (c) The average speed, in km/h, for the whole journey and give your answer correct to 3 significant figures. [2]
- (d) The ratio of the average speeds for each section of the journey. [2]
20. A man bought 450 books for \$1,350. He sold half of them at a profit of 20%, 150 of them at a profit of 10%, and the rest at a loss of 4%. What was his gain percent, to the nearest percent? [4]
21. Peter, Paul, and John each bought a similar television set whose list price was \$640. Peter paid cash and was given a discount of $12\frac{1}{2}\%$. Paul bought his set on hire purchase. He paid a deposit which was $\frac{1}{4}$ of the list price and paid the rest in monthly installments of \$32 for $1\frac{1}{3}$ years. John bought his set with 30 monthly payments. He gave a 10% down payment and was charged 25% interest on the remainder. What is the ratio of the total amount Peter, Paul, and John paid for their television sets? [4]

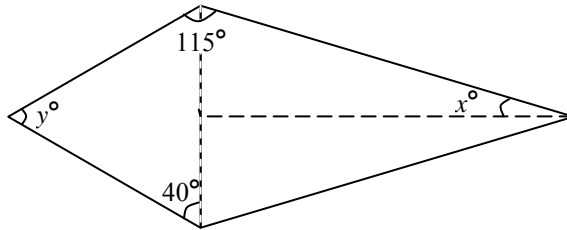
22. Find the value of x .

[3]



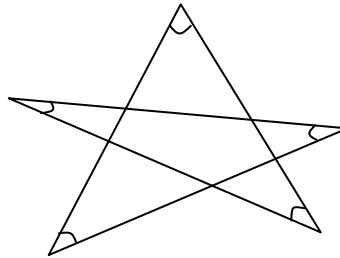
23. The figure is a kite. Find the value of x and y .

[3]



24. Find the sum of the marked angles in the figure below.

[3]



25. (a) How many planes of symmetry does a regular right hexagonal prism have?

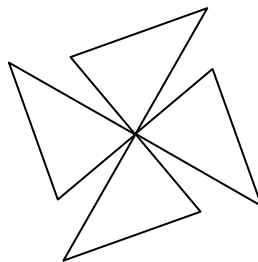
[1]

(b) How many axes of rotational symmetry does a right circular cone have?

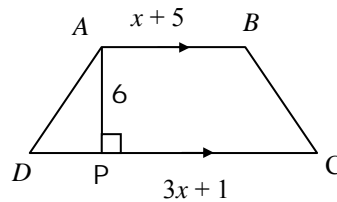
[1]

(c) What is the order of rotational symmetry for the following figure?

[1]



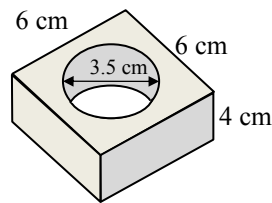
26. In the figure below, $AB = (x + 5)$ cm, $CD = (3x + 1)$ cm, $PA = 6$ cm, and AB is parallel to CD . If the area is 66 cm^2 , find x . [3]



27. The radius of the wheel on a trailer is 35 cm. If the trailer is being pulled by a car traveling at a speed of 90 km/h, how many revolutions does the wheel make in 5 minutes? (Take $\pi = \frac{22}{7}$) [4]

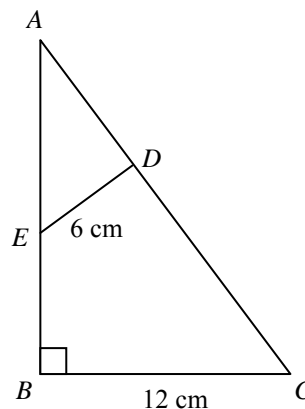
28. A horizontal drinking trough for cattle is in the shape of a triangular prism. It is 6 m long and a cross section is in the shape of a triangle with base length 30 cm and height 20 cm. What is the capacity of the tank in liters? [4]

29. A hole with a diameter of 3.5 cm is drilled through a square metal nut of thickness 4 cm and length 6 cm. (Take $\pi = \frac{22}{7}$)



- (a) What is the mass of this nut if the density of the metal is 6 g/cm^3 ? [3]
 (b) What is the surface area? [3]

30. Triangle ABC is similar to triangle ADE . $DE = 6$ cm and $BC = 12$ cm. If the area of triangle ABC is 90 cm^2 , what is the area of triangle ADE ? [4]



Answer Key

1. 136
2. (a) 17 (b) 50^{th}
3. (a) $3\frac{7}{24}$ (b) 3
4. 0.1
5. (a) 0.057 (b) 5.0
6. 0.75
7. 20
8. $0.7272\dots$; $-\sqrt{64}$; $\frac{22}{7}$; $\sqrt[3]{\frac{125}{27}}$
9. (a) -305 (b) -16 (c) -43
10. (a) $-3a - 8b$ (b) $\frac{13x + 3y}{16}$
11. (a) $3a(1 + 8y)$ (b) $2(x - 4y)(a - 3b)$
12. (a) 2 (b) -28
13. 33
14. 13, 52, 44
15. $10\frac{2}{3}$
16. \$7.20
17. apple - 30 g, banana - 45 g, apricot - 75 g
18. 95%
19. (a) 48 min, 84 min, 72 min (b) 105 km, 84 km
(c) 67.9 km/h (d) 21 : 30 : 28
20. 13%
21. 5 : 6 : 7
22. 59
23. $x = 15$; $y = 100$
24. 180°
25. (a) 7 (b) 1 (c) 4
26. 4
27. 3409
28. 180 liters
29. (a) 633 g (b) 192.75 cm^2
30. 22.5 cm^2