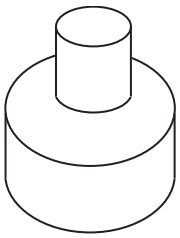
# Mental Math

## Grade 9 Mathematics (10F)

E–1

**Substrand: 3-D Objects and 2-D Shapes** **Specific Learning Outcome: 9.SS.2**

| General Questions | Answers |
|---|---|
| 1. What value of $m$ satisfies the equation $\frac{5}{4}m = 1$? | $m = \frac{4}{5}$ |
| 2. What is the volume of a pool that measures 7 m by 3 m by 2 m? | 42 $m^3$ |
| 3. On average, if you earn \$40 each week, how much money would you earn in one year? | \$2080 |
| 4. Add: 42 + 88 + 58 | 188 |
| 5. How many kilograms are equivalent to 250 g? | 0.25 kg |
| 6. A hockey player scores a goal in 25% of her games. How many goals do you expect her to make if she plays 40 games? | 10 goals |
| **Unit Questions** | |
| **For questions 7, 8, and 9, a right cylinder has a base that measures 10 cm in diameter and is sitting on top of another cylinder with a base that measures 20 cm in diameter (use $\pi \approx 3$).** | |
| 7. Estimate the area of the circular base of the little cylinder. | $\approx$ 75 $cm^2$ |
| 8. Estimate the surface area of the base of the big cylinder. | $\approx$ 300 $cm^2$ |
| 9. Estimate the area that overlaps. | $\approx$ 75 $cm^2$ |
| 10. How many faces are there in a right triangular prism? | 5 faces |
| **Other Questions** | |
| 11. | |
| 12. | |

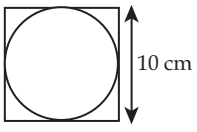


# Mental Math

## Grade 9 Mathematics (10F)

E–2

**Substrand: 3-D Objects and 2-D Shapes** **Specific Learning Outcome: 9.SS.2**

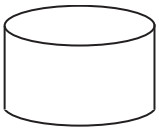
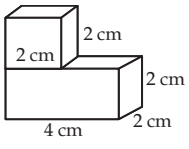
| General Questions | Answers |
|---|---|
| 1. Simplify the ratio 21 : 6. | 7 : 2 |
| 2. Calculate the value of a 15% tip on a bill of $20. | $3 |
| 3. Add: $\frac{1}{2} + \frac{1}{8}$ | $\frac{5}{8}$ |
| 4. Which represents the better purchase: 5 shirts for $100 or 10 shirts for $160? | 10 for $160 |
| 5. Find the area of a circle with a radius of 1 cm (round to the nearest 10th). | 3.1 $cm^2$ |
| 6. There are 53 students registered for Grade 10 Essential Mathematics next year. If 38 more registrations are allowed, what total number of students will be registered? | 91 students |
| **Unit Questions** | |
| 7. How many faces are there in a right rectangular prism? | 6 faces |
| 8. Two cubes with 5 cm edges are glued together so that one is aligned on top of the other. What is the surface area of the glued shape? | 250 $cm^2$ |
| **For questions 9 and 10, a right cylinder with a 10 cm diameter sits on top of a cube with 10 cm edges (as shown below in this top view). Use $\pi \approx 3$.** | |
| 9. Estimate the area that overlaps.   | $\approx$ 75 $cm^2$ |
| 10. Estimate the area that does not overlap. | $\approx$ 25 $cm^2$ |
| **Other Questions** | |
| 11. | |
| 12. | |

# Mental Math

## Grade 9 Mathematics (10F)

E–3

**Substrand: 3-D Objects and 2-D Shapes** **Specific Learning Outcome: 9.SS.2**

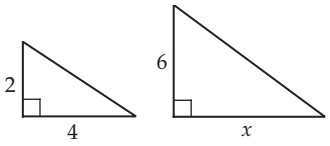
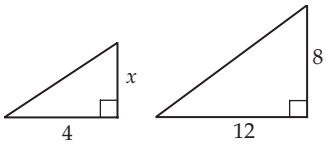
| General Questions | Answers |
|---|---|
| 1. Estimate a tax of 7% on a purchase of $7.86. | ≈ $0.55 |
| 2. Zahra received a mark of $\frac{14}{20}$ on her mathematics assignment. Express her results as a percentage. | 70% |
| 3. How many hours pass between 7:00 a.m. on Monday and 7:00 p.m. on Tuesday? | 36 hours |
| 4. Subtract $\frac{1}{8}$ from $\frac{1}{2}$. | $\frac{3}{8}$ |
| 5. What is the probability of rolling a 4 when you roll a standard 6-sided die? | $\frac{1}{6}$ |
| 6. You owe $300 to a friend. How many weeks will it take you to repay your debt if you give your friend $12 a week? | 25 weeks |
| **Unit Questions** | |
| **For questions 7 and 8, refer to a right cylinder with a base having a radius measuring 3 cm and a height of 2 cm.** | |
| 7. Estimate the area of the circular end (use $\pi \approx 3$).  | ≈ 27 cm$^2$ |
| 8. Estimate the area of the curved surface. | ≈ 36 cm$^2$ |
| **For questions 9 and 10, use the diagram below in which a cube is on top of a rectangular prism.** | |
| 9. Determine the area of the overlap.   | 4 cm$^2$ |
| 10. Determine the surface area of the front face of the shape. | 12 cm$^2$ |
| **Other Questions** | |
| 11. | |
| 12. | |

# Mental Math

## Grade 9 Mathematics (10F)

E–4

**Substrand: 3-D Objects and 2-D Shapes** **Specific Learning Outcome: 9.SS.3**

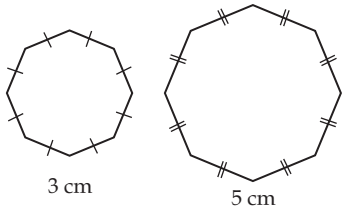
| General Questions | Answers |
|---|---|
| 1. You have \$216 in your wallet. How much money will you have left over if you purchase a bracelet for \$80? | \$136 |
| 2. Evaluate: $\frac{1}{2} \times \frac{3}{8}$ | $\frac{3}{16}$ |
| 3. How much money will you get back if you make a purchase of \$14.76 with a \$20 bill? | \$5.24 |
| 4. How many \$10 bills are equivalent to \$1000? | 100 bills |
| 5. Find the area of a triangle with a base of 4 m and a height of 6 m. | 12 $m^2$ |
| 6. Solve the equation $4 + 2x = 10$. | $x = 3$ |
| **Unit Questions** | |
| 7. Two similar triangles are shown. Find the value of $x$.   | 12 |
| 8. If two triangles are similar, the measurements of their corresponding sides are equal. True or false? | False |
| 9. Complete the sentence. If two triangles are similar, the measures of their corresponding angles are _____. | equal |
| 10. Two similar triangles are shown. Find the value of $x$.   | $\frac{8}{3}$ |
| **Other Questions** | |
| 11. | |
| 12. | |

# Mental Math

## Grade 9 Mathematics (10F)

E–5

**Substrand: 3-D Objects and 2-D Shapes** **Specific Learning Outcome: 9.SS.3**

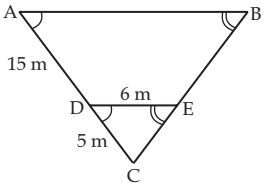
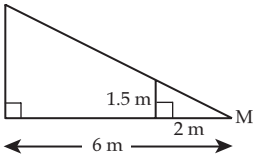
| General Questions | Answers |
|---|---|
| 1. Simplify the fraction $\frac{12}{16}$. | $\frac{3}{4}$ |
| 2. You deposit two cheques of \$438 and \$142 in your savings account. What is the total amount of your deposit? | \$580 |
| 3. What is the volume of a pool that measures 20 m by 4 m by 10 m? | 800 $m^3$ |
| 4. If you raise the price of a pair of \$240 skates by 10%, what is the new price? | \$264 |
| 5. Which of the following fractions is smaller: $\frac{4}{9}$ or $\frac{2}{3}$? | $\frac{4}{9}$ |
| 6. How much will each of 7 lottery prize winners get if they divide \$3500 equally? | \$500 |
| **Unit Questions** | |
| 7. A regular octagon with 5 cm sides is similar to a regular octagon with 10 cm sides. True or false? | True |
| 8. A regular pentagon with 2 cm sides is similar to a regular hexagon with 2 cm sides. True or false? | False |
| 9. Are these two polygons similar? Explain.   | Yes, same shape and same angles |
| 10. Solve for $x$ in the proportion: $\frac{x}{8\text{ cm}} = \frac{3\text{ cm}}{2\text{ cm}}$ | $x$ = 12 cm |
| **Other Questions** | |
| 11. | |
| 12. | |

# Mental Math

## Grade 9 Mathematics (10F)

E–6

**Substrand: 3-D Objects and 2-D Shapes** **Specific Learning Outcome: 9.SS.3**

| General Questions | Answers |
|---|---|
| 1. If 89% of 200 students from a school live at least 10 km from school, how many students live at least 10 km from school? | 178 students |
| 2. Evaluate: −17 + 24 | 7 |
| 3. How much tax at 13% is there on a $5 book? | $0.65 |
| 4. What is the measure of the third angle of a right triangle with an angle of 50°? | 40° |
| 5. One week, it rained 16 mm in Winnipeg. The second week, it rained 5 mm and the third week, it rained 9 mm. How many millimetres did it rain on average each week in Winnipeg over the 3 weeks? | 10 mm |
| 6. Write the expression that corresponds to the sum of $m$ cubed and $m$. | $m^3 + m$ |
| **Unit Questions** | |
| 7. Find the length of side AB.   | 24 m |
| 8. You measure 1.5 m in height and your shadow is 2 m long. A tree's shadow is 6 m long. Find the height of the tree.   | 4.5 m |
| 9. Any two squares are similar. True or false? | True |
| 10. Two hexagons can be similar if one hexagon is regular and the other is not. True or false? | False |
| **Other Questions** | |
| 11. | |
| 12. | |