

**SAMPLE EXAM**

# Year 9 Advanced - Half Yearly Examination

Name: \_\_\_\_\_

Time Allowed: 90 minutes

**Strand: Number (Allow approx. 36 minutes)**

1. Evaluate:

(a)  $16 + 3 \times 7 - 4 \times (-3)$

\_\_\_\_\_

(b)  $\frac{15 \times \sqrt{5^2 + 12^2}}{7.5 \div 1.5}$

\_\_\_\_\_

2. Simplify:

(a)  $\frac{3}{7} \div \frac{3}{14}$

\_\_\_\_\_

(b)  $\frac{\frac{3}{4} - \frac{1}{2}}{1 - \left(\frac{2}{5}\right)\left(\frac{5}{6}\right)}$

\_\_\_\_\_

3. Evaluate:

(a)  $3.25^2 \times 7.62$  correct to 4 significant figures.

\_\_\_\_\_

(b)  $\frac{1}{6.2} \div \frac{3}{13.9}$  correct to 1 decimal place.

\_\_\_\_\_

4. State whether the following are rational or irrational:

(a)  $\sqrt{225}$  \_\_\_\_\_

(b)  $\sqrt{3}$  \_\_\_\_\_

(c)  $\frac{\pi}{2}$  \_\_\_\_\_

5. Express  $\frac{17}{40}$  as a decimal.

\_\_\_\_\_

6. Express  $47\frac{2}{3}\%$  as a simplified fraction.

\_\_\_\_\_

7. Express 0.032 as a percentage.

\_\_\_\_\_

8. Express  $\frac{4}{5}$  as a percentage.

\_\_\_\_\_

9. Express 137% as a decimal.

\_\_\_\_\_

10. Express 0.308 as a simplified fraction.

\_\_\_\_\_

11. Find 27% of \$628.

\_\_\_\_\_

12. Increase 64 kg by 25%.

\_\_\_\_\_

13. A car worth \$20,000 is now worth \$17,500. What percentage has it depreciated by?

\_\_\_\_\_

14. Simplify \$8 : 88¢.

\_\_\_\_\_

15. If 15% of Jenny's height is 24 cm, what is Jenny's height?

\_\_\_\_\_

16. John earns \$10.70 per hour. How long must he work to earn \$342.40?

\_\_\_\_\_

17. A surgeon earns \$1376.50 per week. What is his annual salary?

\_\_\_\_\_

18. Connor earns \$9.60 per hour as a farmhand. He is paid his normal rate for the first 36 hours he works in a week, time-and-a-half for the next 5 hours and double-time after that. How much does he earn if he works 44 hours in a certain week?

\_\_\_\_\_

19. Sharon is paid \$190/week plus \$48 per mobile phone she sells in excess of 4. What is her weekly income if she sells 12 mobile phones?

\_\_\_\_\_

20. What is the best value? (show working)

A 420 g mince at \$3.70

B 600 g mince at \$5.22

C 1.3 kg mince at \$11.57

\_\_\_\_\_

**Strand: Algebra (Allow approx. 18 minutes)**

1. Write an expression for the sum of 8 and  $a$ .

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2. A tap is dripping at a rate of 11 millilitres every minute. How many millilitres would drip in  $p$  minutes?

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3. Simplify the following:

(a)  $3m + 7m$

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(b)  $6x - 3 + 2x - 2$

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(c)  $-4y^2 + y + 7y^2$

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(d)  $2a \times 4a$

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(e)  $-3g \times 2gh^2$

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(f)  $15x^2y \div 20xy$

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(g)  $8t - 2t \times 3$

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(h)  $\frac{3x}{7} - \frac{x}{7}$

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(i)  $\frac{2x}{3} + \frac{x}{4}$

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(j)  $\frac{b}{30} \times \frac{12}{b^2}$

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(k)  $\frac{3t}{p} + \frac{t}{3p}$

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4. Expand the following (and simplify only if possible):

(a)  $6(2t - 1)$

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(b)  $-z(7 - 2z)$

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(c)  $4(2d - 3) - 2(d + 3)$

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5. If  $a = 4$  and  $b = -3$ , find:

(a)  $2a + b$

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(b)  $b(a - b)$

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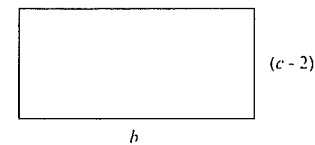
(c)  $\frac{2a - 3b}{-1}$

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6. Write an expression for the area of: (simplify if possible)

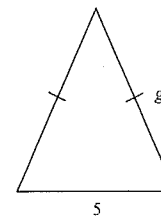



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7. Write an expression for the perimeter of: (simplify if possible)




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**Strand: Geometry (Allow approx 18 minutes)**

1. Draw an obtuse angle.

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2. With a compass and a ruler, bisect the obtuse angle in Question 1.

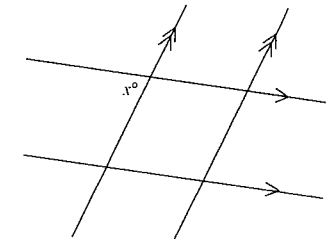
3. What does perpendicular mean?

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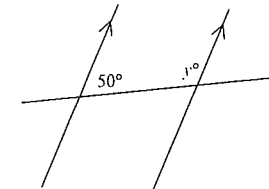
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4. Mark all the angles equal to  $x^\circ$  in the diagram below:



5. Find the value of  $y$  in each of the following, giving reasons:

(a)




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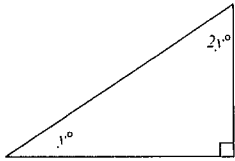


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(b)




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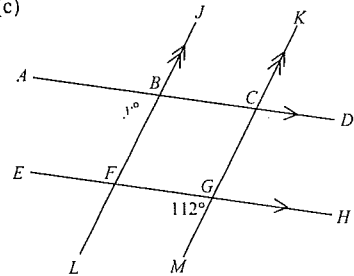


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(c)




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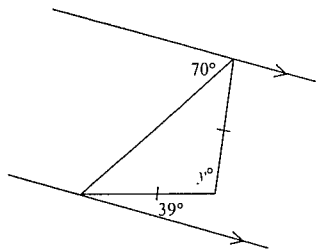


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(d)




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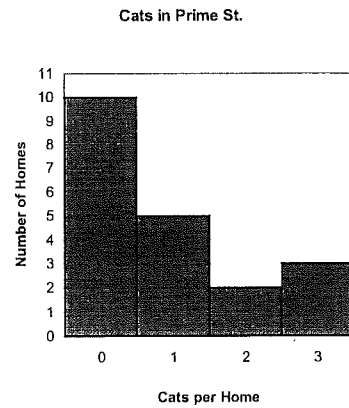
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**Strand: Data (Allow approx 9 minutes)**

1. The following graph indicates the number of cats in households on Prime St.



(a) How many homes have 1 cat?

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(b) How many homes are there altogether on Prime St?

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(c) How many cats are there altogether on Prime St?

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(d) What is the average number of cats per home on Prime St?

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2. For the numbers 7, 11, 9, 17, 13, find:

(a) the average \_\_\_\_\_

(b) the median \_\_\_\_\_

**Strand: Measurement (Allow approx 9 minutes)**

1. Convert the following:

(a) 3 hours = \_\_\_\_\_ min

(b) 4.7 L = \_\_\_\_\_ mL

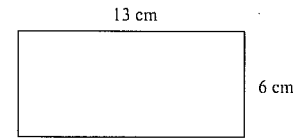
(c) 9,500 m = \_\_\_\_\_ km

(d) 3 days = \_\_\_\_\_ minutes

(e) 0.07 tonnes = \_\_\_\_\_ g

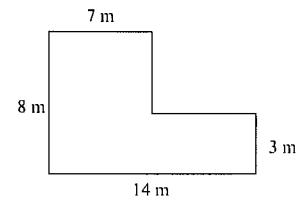
2. Find the perimeter of each of the following shapes?

(a)




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(b)



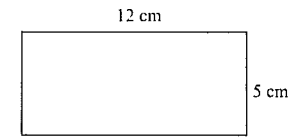

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3. Find the areas of the following shapes:

(a)

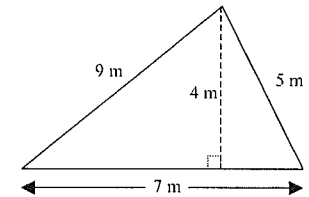



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(b)

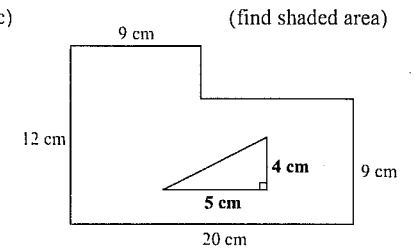



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(c)




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