

School Name
Mathematics Test 2017

Year 8

Equations

Non Calculator
Section

Skills and Knowledge Assessed:

- Solve simple linear equations (ACMN A179)
- Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (ACMNA194)

Name _____

Answer all questions in the spaces provided on this test paper by:

Writing the answer in the box provided.

or

Shading in the bubble for the correct answer from the four choices provided.

Show any working out on the test paper. Calculators are **not** allowed.

1.

Which is the correct solution to:

$$6x = 18$$

☐

$x = 3$

☐

$x = 12$

☐

$x = 24$

☐

$x = 108$

2.

Give the solution to:

$$p + 12 = 20$$

$$p = \boxed{}$$

3.

What number is missing from the sentence?

☒

$- 10 = 20$

☐

2

☐

10

☐

30

☐

200

4.

Give the solution to:

$$\frac{a}{5} = 7$$

$$a =$$

5.

Solve $3x + 8 = 35$

$x = \boxed{}$

6.

What number is missing from the sentence?

$7 \times \boxed{?} - 10 = 46$

☐ $5\frac{1}{7}$

☐ 8

☐ 16

☐ $20\frac{1}{2}$

7.

What number is missing from the sentence?

$3 \times (\boxed{?} - 2) = 18$

☐ 5

☐ 7

☐ 8

☐ 60

8.

Which line in the solution to the equation $12m - 5 = 3m + 22$ contains an error?

$$12m - 5 = 3m + 22$$

Line 1 $12m - 3m - 5 = 22$

Line 2 $9m - 5 = 22$

Line 3 $9m = 22 + 5 = 27$

Line 4 $m = 27 \times 9 = 243$

☐ Line 1

☐ Line 2

☐ Line 3

☐ Line 4

9.

Solve $5(x - 4) = 3x$

☐ $x = -2$

☐ $x = 2$

☐ $x = 4$

☐ $x = 10$

10.

Test the possible solutions below to find the correct solution to the equation:

$8 - 5m = -3m$

☐ $m = -4$

☐ $m = 4$

☐ $m = 8$

☐ $m = 12$

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Name _____

Answer all questions in the spaces provided on this test paper by:

Writing the answer in the box provided.

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Shading in the bubble for the correct answer from the four choices provided.

Show any working out on this test paper. Calculators are allowed.

1.

Give the solution to:

$$k - 0.27 = 0.45$$

$$k = \boxed{}$$

2.

Which calculation could be used to find the solution to the equation $4.5m = 7.2$?

☐ $m = 7.2 + 4.5$

☐ $m = 7.2 - 4.5$

☐ $m = 7.2 \times 4.5$

☐ $m = 7.2 \div 4.5$

3.

Which is the correct solution to:

$$p + 452 = 901$$

☐ $p = 1.99$

☐ $p = 449$

☐ $p = 675$

☐ $p = 1350$

4.

Solve: $\frac{x}{46} = 5$

$$x = \boxed{}$$

5. Solve: $6y + 4.5 = 24$

$$y = \boxed{}$$

6. Solve the equation $7(m + 6) = 28$.

☐ $m = -2$ ☐ $m = -1$ ☐ $m = 2$ ☐ $m = 10$

7. Which is the correct solution to the equation :

$$\frac{5v}{3} = -10$$

☐ $v = -16\frac{2}{3}$ ☐ $v = -15$ ☐ $v = -6$ ☐ $v = -5$

8. Which line in the solution to the equation $\frac{2x}{3} - 12 = 6$ contains an error?

$$\frac{2x}{3} - 12 = 6$$

Line 1 $\frac{2x}{3} = 6 - 12 = -6$

Line 2 $2x = -6 \times 3 = -18$

Line 3 $x = -\frac{18}{2}$

Line 4 $x = -9$

☐ Line 1 ☐ Line 2 ☐ Line 3 ☐ Line 4

9.

Which is the solution to $\frac{m+8}{5} = -3$?

 $m =$

10.

Solve $-2(b-6) = 17$

 $b =$

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Longer Answer Section

Calculator Allowed

Name

Write all working and answers in the spaces provided on this test paper.

Marks may not be awarded if working out and/or answers are not clear.

Marks allocated are shown beside each question.

Calculators are allowed.

Marks

1. Solve the equations below, showing all steps of working, regardless of the method used.

(a) $2m + 8 = 22$

2

.....

.....

.....

(b) $7 + \frac{x}{5} = 11$

2

.....

.....

.....

(c) $6(x + 11) = 45$

2

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.....

.....

(d) $12m = 15 + 10m$

2

.....

.....

.....

2. Solve the equations below, showing all steps of working, regardless of the method used.

(a) $2x + 5 = 15 - 3x$

3

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.....

.....

.....

(b) $\frac{2x + 4}{3} = 10$

3

.....

.....

.....

.....

(c) $\frac{p}{5} - 7 = p - 2$

3

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.....

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.....

(d) $10 - 3(m + 4) = 3m - 2$

3

.....

.....

.....

.....

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ANSWERS

Question	Working and Answer
1.	$6x = 18$ $x = \frac{18}{6}$ $x = 3$ <p>1st Answer</p>
2.	$p + 12 = 20$ $p = 20 - 12$ $\mathbf{p = 8}$
3.	$\boxed{?} - 10 = 20$ $\boxed{?} = 20 + 10$ $\boxed{?} = \boxed{30}$ <p>3rd Answer</p>
4.	$\frac{a}{5} = 7$ $a = 5 \times 7$ $\mathbf{a = 35}$

Question	Working and Answer
5.	$3x + 8 = 35$ $3x = 35 - 8$ $3x = 27$ $x = \frac{27}{3}$ $\mathbf{x = 9}$
6.	$7 \times \boxed{?} - 10 = 46$ $7 \times \boxed{?} = 46 + 10 = 56$ $\boxed{?} = 56 \div 7$ $\boxed{?} = 8$ <p>2nd Answer</p>
7.	$3 \times (\boxed{} - 2) = 18$ $(\boxed{} - 2) = 18 \div 3 = 6$ $\boxed{} = 6 + 2 = 8$ <p>3rd Answer</p>
8.	<p>Line 4 should be $m = 27 \div 9 = 3$</p> <p>4th Answer</p>
9.	$5(x - 4) = 3x$ $5x - 20 = 3x$ $-20 = -2x$ $x = \frac{-20}{-2} = 10$ <p>4th Answer</p>
10.	<p>Test $m = 4$</p> $\text{LHS} = 8 - 5m = 8 - 5 \times 4 = 8 - 20 = -12$ $\text{RHS} = -3m = -3 \times 4 = -12$ <p>Since LHS = RHS $m = 4$ is a solution</p> <p>2nd Answer</p>

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Question	Working and Answer
1.	$k - 0.27 = 0.45$ $k = 0.45 + 0.27$ $k = \mathbf{0.72}$
2.	$4.5 \times m = 7.2$ so $m = 7.2 \div 4.5$ 4th Answer
3.	$p + 452 = 901$ $p = 901 - 452$ $p = 449$ 2nd Answer
4.	$\frac{x}{46} = 5$ $x = 5 \times 46$ $x = \mathbf{230}$
5.	$6y + 4.5 = 24$ $6y = 24 - 4.5 = 19.5$ $y = \frac{19.5}{6}$ $y = \mathbf{3.25}$

6.	$7(m + 6) = 28$ $m + 6 = \frac{28}{7} = 4$ $m = 4 - 6$ $m = -2$ <p>1st Answer</p>
7.	$\frac{5v}{3} = -10$ $5v = -10 \times 3$ $5v = -30$ $v = \frac{-30}{5}$ $v = -6$ <p>3rd Answer</p>
8.	Line 1 should be $\frac{2x}{3} = 6 + 12 = 18$ <p>1st Answer</p>
9.	$\frac{m + 8}{5} = -3$ $m + 8 = -3 \times 5 = -15$ $m = -15 - 8$ $\mathbf{m = -23}$
10.	$-2(b - 6) = 17$ $b - 6 = \frac{17}{-2} = -8\frac{1}{2}$ $b = -8\frac{1}{2} + 6$ $\mathbf{b = -2\frac{1}{2}}$

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Longer Answer
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ANSWERS

Question	Working and Answer	Marks
1.	(a) $2m + 8 = 22$ $2m = 22 - 8$ $2m = 14$ $m = \frac{14}{2}$ $m = 7$	2 marks for correct answer with working 1 mark for attempt that shows some progress toward answer, or for answer without working
	(b) $7 + \frac{x}{5} = 11$ $\frac{x}{5} = 11 - 7$ $\frac{x}{5} = 4$ $x = 4 \times 5$ $x = 20$	2 marks for correct answer with working 1 mark for attempt that shows some progress toward answer, or for answer without working
	(c) $6(x + 11) = 45$ $x + 11 = \frac{45}{6}$ $x + 11 = 7.5$ $x = 7.5 - 11$ $x = -3.5$	2 marks for correct answer with working 1 mark for attempt that shows some progress toward answer, or for answer without working

Question	Working and Answer	Marks
	(d) $12m = 15 + 10m$ $12m - 10m = 15$ $2m = 15$ $m = \frac{15}{2}$ $m = 7.5$	2 marks for correct answer with working 1 mark for attempt that shows some progress toward answer, or for answer without working
2.	(a) $2x + 5 = 15 - 3x$ $2x = 15 - 5 - 3x$ $2x = 10 - 3x$ $2x + 3x = 10$ $5x = 10$ $x = \frac{10}{5}$ $x = 2$	3 marks for correct answer with working. 2 marks for mostly correct working with a minor error. 1 mark for attempt that shows some progress toward answer, or answer without working.
	(b) $\frac{2x + 4}{3} = 10$ $(2x + 4) = 10 \times 3$ $2x + 4 = 30$ $2x = 30 - 4$ $2x = 26$ $x = \frac{26}{2}$ $x = 13$	3 marks for correct answer with working. 2 marks for mostly correct working with a minor error. 1 mark for attempt that shows some progress toward answer, or answer without working.

Question	Working and Answer	Marks
	<p>(c) $\frac{p}{5} - 7 = p - 2$</p> $\frac{p}{5} = p - 2 + 7$ $\frac{p}{5} = p + 5$ $p = 5 \times p + 5 \times 5$ $p = 5p + 25$ $p - 5p = 25$ $-4p = 25$ $p = \frac{25}{-4}$ $p = -6\frac{1}{4}$	<p>3 marks for correct answer with working.</p> <p>2 marks for mostly correct working with a minor error.</p> <p>1 mark for attempt that shows some progress toward answer, or answer without working.</p>
	<p>(d) $10 - 3(m + 4) = 3m - 2$</p> $-3(m + 4) = 3m - 2 - 10$ $-3(m + 4) = 3m - 12$ $m + 4 = \frac{3m}{-3} - \frac{12}{-3}$ $m + 4 = -m + 4$ $m + m + 4 = 4$ $2m + 4 = 4$ $2m = 4 - 4$ $2m = 0$ $m = \frac{0}{2}$ $m = 0$	<p>3 marks for correct answer with working.</p> <p>2 marks for mostly correct working with a minor error.</p> <p>1 mark for attempt that shows some progress toward answer, or answer without working.</p>