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LOCATION: SWANSEA

LLEOLIAD: ABERTAWE

LEVEL 3

LEFEL 3

EXAMINATION PERIOD
NOVEMBER 2016

MODULE CODE: M3X01512
MATHEMATICS (TEST 1)

TIME: 1 HOUR

ANSWER ALL QUESTIONS

Equipment or materials required –

Calculators allowed

Formula booklet provided

Show all workings

1. Using examples of your own, write down each of the following

- (i) Improper fraction
 - (ii) Mixed fraction
 - (iii) Proper fraction
- (3)

2. Express the following in their simplest form :

- (i) $\frac{15}{40}$
 - (ii) $\frac{84}{196}$
 - (iii) $\frac{2096}{4192}$
- (3)

3. Calculate the following, **showing all your workings**, and giving your answers as mixed fractions in their simplest form:

- (i) $9\frac{2}{5} - 4\frac{1}{3}$
 - (ii) $5\frac{1}{4} \times 3\frac{2}{5}$
- (6)

4. Express 0.0148953 to 4 decimal places and 3 significant figures.

(2)

5. Express the following numbers in standard form :

- (i) 143
 - (ii) 0.00000143
- (2)

6. Simplify the following as far as possible :

- (i) $p^4 \times p^3$
 - (ii) $(2t^2)^4$
 - (iii) $\frac{m^3 \times m^5}{m^6}$
 - (iv) $\sqrt{\frac{1}{x^2}}$
 - (v) $\sqrt[4]{m^3 \times m^5}$
- (10)

7. Evaluate the following, when $p = 4$, $q = -2$ and $r = -3$.

$$\frac{2r - 4q^2}{pqr}$$

Expressing your answer as a fraction in its lowest terms.

(5)

8. Factorise the following completely :

- (i) $7p^3q^2 - 14pq^2$
- (ii) $m^2 - 100$
- (iii) $x^2 + 10x + 21$
- (iv) $3x^2 + 17x + 10$

(10)

9. Expand the following brackets, simplifying your answers as far as possible :

- (i) $(x + 5)(x - 2)$
- (ii) $(p - 4)(p^3 - 2p^2 + 4p - 5)$

In the case of (ii), state the coefficient of p^3

(9)

10. Solve the following linear equations for x , and in each case, give your answers **correct to one decimal place**.

(i) $3(x - 2) - 4(x + 8) = 2(7 - x)$

(ii) $\frac{3x-4}{5} = \frac{3-2x}{4}$

(iii) $(2x - 1)^2 = (3 + 2x)^2$

(13)

Maximum 63 Marks

Q1

Any correct answer

MAX MARK
63

11 1

(3)

Q2

$$\frac{18}{40}$$

$$\frac{3}{8}$$

$$\frac{84}{196}$$

$$\frac{42}{98}$$

$$\frac{21}{49}$$

$$\frac{3}{7}$$

$$\frac{2096}{4192} = \frac{1}{2}$$

(3)

Q3

(i)

$$9\frac{2}{5} - 4\frac{1}{3}$$

$$\frac{47}{5} - \frac{13}{3}$$

$$\frac{141}{15} - \frac{65}{15}$$

$$\frac{76}{15}$$

$$5\frac{1}{3}$$

$$5\frac{1}{3}$$

(ii)

$$5\frac{1}{4} \times 3\frac{2}{5}$$

$$\frac{21}{4} \times \frac{17}{5}$$

$$= \frac{357}{20}$$

$$17\frac{17}{20}$$

(iii)

$$7\frac{1}{7} \div 4\frac{2}{9}$$

$$\frac{50}{7} \div \frac{38}{9}$$

$$25 \frac{50}{7} \times \frac{9}{38}$$

$$\frac{225}{133}$$

$$= 1\frac{92}{133}$$

(10 marks)

8 (i) $7p^3q^2 - 14pq^2$

$7pq^2(p^2 - 2)$

- 1 1 1

(ii) $m^2 - 100$

$(m + 10)(m - 10)$

1 1

(iii) $x^2 + 10x + 21$

$(x + 3)(x + 7)$

1 1

(iv) $3x^2 + 17x + 10$

$(3x + 2)(x + 5)$

2 1

(v) $p^2 + 5p - 36$

$(p + 9)(p - 4)$

1 1

(vi) $zr - zp - rv + pv$

$z(r - p) - v(r - p)$

$(z - v)(r - p)$

1 1

1

10 marks

9 (i) $(x + 5)(x - 2)$

$x^2 - 2x + 5x - 10$

$x^2 + 3x - 10$

1 1 1

(ii) $(2x - 3)(x + 9)$

$2x^2 + 18x - 3x - 27$

$2x^2 + 15x - 27$

1 1 1

(iii) $(p - 4)(p^3 - 2p^2 + 4p - 5)$

$p^4 - 2p^3 + 4p^2 - 5p - 4p^3 + 8p^2 - 16p + 20$

gives

$p^4 - 6p^3 + 12p^2 - 21p + 20$

1 1 1 1 1

Coefficient of p^3 is "-6"

1

12 marks

Q. 10

$$(i) \quad 3(x-2) - 4(x+8) = 2(7-x)$$

$$3x - 6 - 4x - 32 = 14 - 2x$$

$$x = 52$$

$$\therefore x = \underline{52.0} \text{ (1 decimal)}$$

$$(ii) \quad \frac{3x-4}{5} = \frac{3-2x}{4}$$

$$4(3x-4) = 5(3-2x)$$

$$12x - 16 = 15 - 10x$$

$$12x + 10x = 15 + 16$$

$$22x = 31$$

$$\therefore x = \frac{31}{22}$$

$$\underline{x = 1.4}$$

$$(iii) \quad (2x-1)^2 = (3+2x)^2$$

$$(2x-1)(2x-1) = (3+2x)(3+2x)$$

$$4x^2 - 2x - 2x + 1 = 9 + 6x + 6x + 4x^2$$

$$-4x + 1 = 9 + 12x$$

$$-16x = 8$$

$$x = -\frac{8}{16}$$

$$\underline{x = -0.5}$$

$$(iv) \quad \frac{x}{2} + \frac{4x-1}{3} = 5$$

x by 6

$$6\left(\frac{x}{2}\right) + 6\left(\frac{4x-1}{3}\right) = 6 \times 5$$

$$\text{i.e. } 3x + 2(4x-1) = 30$$

$$3x + 8x - 2 = 30$$

$$11x = 32$$

$$x = \frac{32}{11}$$

$$\underline{x = 2.9}$$

OUT OF 21

(3)

(4)

(6)

(3)

12

