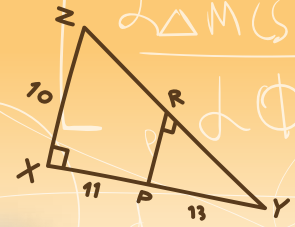
PONY

سلسلة كتب الاستاذ



Math

2024

Preparatory

1

Second Term

FEBRUARY REVISION

Algebra

Model 1

First Choose the correct answer:

1. $(X^2)^{-3} \times X^6 =$ ..... (X^{12} or X^{-12} or X or 1)
2. Half of the number $2^{20} =$ ..... (2^{10} or 2^{11} or 2^{19} or 2^{40})
3. The multiplicative inverse of $(\frac{-3}{5})^0$ is ..... . ($\frac{3}{5}$ or $\frac{-5}{3}$ or 1 or -1)

Second Complete the following:

1. If $x = \frac{1}{2}$, $y = \frac{1}{4}$, then $(x - y)^{-1} =$ ..... .
2. $2^{2x} + 4^x = 4$.....
3. $\frac{8}{27} = (\frac{2}{3})$.....

Third Answer the following:

1. If $x = \frac{-2}{3}$ and $y = \frac{-1}{3}$, find the value of: $x^2 + y^3$.

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2. **Find the value of:**

$$\frac{(3^{-2})^3}{3^{-2} \times 3^{-6}}$$

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Model 2

First Choose the correct answer:

1. $3^{-1} + 3^{-1} + 3^{-1} =$ ..... (3^{-3} or 3^{3} or 9^{-3} or 1)
2. If $x = y$, then $5^{x-y} =$ ..... . (zero or 9 or 5 or 1)
3. If $2^{x} = 2$, $2^{y} = 3$, then $2^{x+y} =$ ..... . (1 or $\frac{2}{3}$ or 6 or -1)

Second Complete the following:

1. $\frac{9}{16} = (\frac{4}{3})^{.....}$
2. The multiplicative inverse of $(\frac{-4}{5})^{2}$ is ..... .
3. $(\frac{-21x^{5}}{67y^{9}})^{\text{zero}} =$ ..... $(X \neq 0, y \neq 0)$

Third Answer the following:

1. **Find the value of:**

$$\frac{3^{-4} \times 3^{-3}}{3^{-7}}$$

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2. If $x = \frac{-3}{2}$, $y = \frac{1}{2}$ and $z = \frac{-4}{3}$, find the numerical value of: $(xyz)^{2}$.

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Model 3

First Choose the correct answer:

1. If $(y)^{-1} = 5$, then $y =$ ..... . (-5 or ± 5 or $\frac{-1}{5}$ or $\frac{1}{5}$)
2. If $x = -4$ and $y = 5$, then $(\frac{x}{y})^2 =$ ..... . ($\frac{-16}{25}$ or $\frac{16}{25}$ or $\frac{-25}{16}$ or $\frac{25}{16}$)
3. The additive inverse of the number $(\frac{-2}{3})^2$ is ..... .
($\frac{4}{9}$ or $\frac{-4}{9}$ or $\frac{9}{4}$ or $\frac{-9}{4}$)

Second Complete the following:

1. If $6^x = 4$, then $6^{x+2} =$ ..... .
2. $3^7 \times 3^{-7} = 5$.....
3. (x^2)..... $= \frac{1}{x^4}$

Third Answer the following:

1. If $x = \frac{1}{2}$, $y = \frac{1}{3}$, find the numerical value of: $(x + y)^{-2}$.

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2. Simplify to the simplest form: $(x^2)^{-3} \div (x^{-1})^2$ where $x \neq 0$

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Geometry

Model 1

First Choose the correct answer:

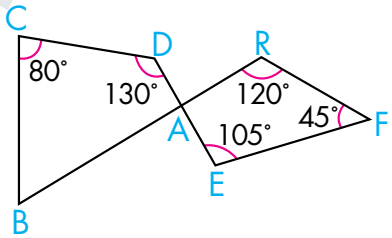
1. The measure of the interior angle of a regular polygon of 10 sides equals ..... .
(72° or 108° or 144° or 150°)
2. The sum of the exterior angles of a regular hexagon equals ..... .
(60° or 180° or 360° or 720°)
3. The measure of an interior angle of a regular pentagon is ..... .
(540° or 120° or 108° or 72°)

Second Complete the following:

1. The sum of measures of the interior angles of the heptagon is ..... °.
2. If the perimeter of a regular polygon is 60 cm and its side length is 10 cm, then the measure of each interior angle in it is ..... °.
3. The number of sides of a regular polygon in which the measure of one of its interior angles is 135° is ..... sides.

Third Answer the following:

1. **In the opposite figure:**
$\overline{ED} \cap \overline{RB} = \{A\}$, m (∠F) = 45° ,
m (∠R) = 120° , m (∠E) = 105° ,
m (∠D) = 130° and m (∠C) = 80°
Find: m (∠B)



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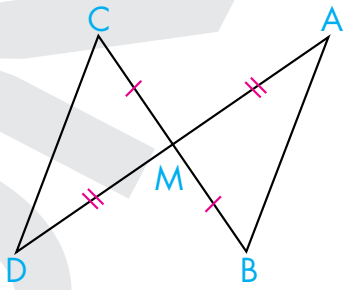
2 **In the opposite figure:**

$\overline{AD} \cap \overline{BC} = \{M\}$,

MA = MD and MB = MC



Prove that:

a AB = CD

b $\overline{AB} \parallel \overline{CD}$

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Model 2

First Choose the correct answer:

1. The number of diagonals of hexagon equals ..... . (3 or 5 or 7 or 9)
2. The sum of measures of the accumulative angles at a point equals ..... . (90° or 180° or 360° or 540°)
3. The sum of the measures of the interior angles of any quadrilateral equals ..... . (170° or 180° or 360° or 90°)

Second Complete the following:

1. The measure of the exterior angle of the equilateral triangle is ..... .
2. The sum of the measures of the interior angles of the pentagon is ..... .
3. In any triangle, there are at least two ..... angles.

Third Answer the following:

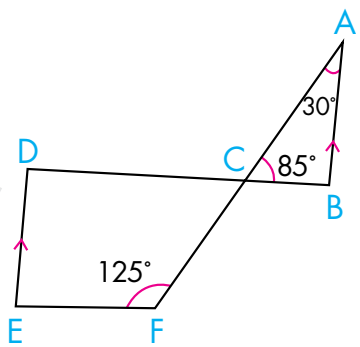
1. **In the opposite figure:**

$\overline{BD} \cap \overline{AF} = \{C\}$, $\overline{AB} \parallel \overline{ED}$

m ($\angle A$) = 30° , and m ($\angle ACB$) = 58° ,

m ($\angle CFE$) = 125°

Find: m ($\angle E$)



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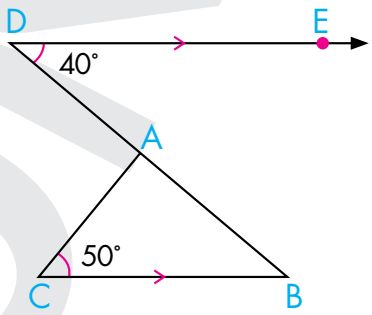
2 **In the opposite figure:**

ABC is a triangle, $\overline{CB} \parallel \overrightarrow{DE}$, m (∠D) = 40° , m (∠C) = 50°



Find with proof:

a m (∠B)

b m (∠CAB)

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Model 3

First Choose the correct answer:

1. the measure of the exterior angle of the equilateral triangle equals ..... .
(120° or 60° or 100° or 90°)

2. In the quadrilateral ABCD if $m(\angle A) = 2\ m(\angle B) = m(\angle C) = 84°$,
the $m(\angle D)$ = ...
(42° or 126° or 150° or 84°)

3. The sum of measures of the interior angles of a polygon of n sides equals ..... .
(n x 180 or $(n - 2)$ x 180 or $\frac{(n - 2) \times 180}{2}$ or $\frac{(n - 2) \times 180}{n}$)

Second Complete the following:

1. If the perimeter of regular pentagon is 60 cm,
then its side length is ..... .

2. The number of axes of symmetry of the equilateral triangle is ..... .

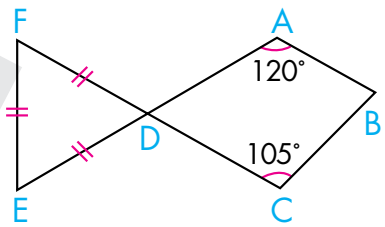
3. The sum of measures of the interior angles of the quadrilateral = ...

Third Answer the following:

1. **In the opposite figure:**

$\overline{AE} \cap \overline{CF} = \{D\}$, ΔDFE is an equilateral triangle , $m(\angle A) = 120°$, $m(\angle C) = 105°$

Find: $m(\angle B)$



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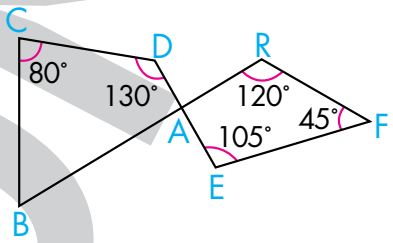
2 **In the opposite figure:**

$\overline{AD} \cap \overline{BC} = \{M\}$,

MA = MD and MB = MC



Prove that:

a AB = CD

b $\overline{AB}$ // $\overline{CD}$

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Algebra Model Answers

Model 1

First:

1) 1 2) 2^{19} 3) 1

Second:

1) 4 2) 4^{2x} 3) $(\frac{2}{3})^3$

Third:

1) $(\frac{-2}{3})^2 + (\frac{-1}{3}) = \frac{4}{9} - \frac{1}{9} = \frac{3}{9} = \frac{1}{3}$

2) $\frac{3^{-6}}{3^{-2} \times 3^{-6}} = \frac{3^2 \times 3^6}{3^6} = 3^2 = 9$

Model 2

First:

1) 1 2) 1 3) 6

Second:

1) -2 2) $\frac{25}{16}$ 3) 1

Third:

1) $\frac{3^7}{3^4 \times 3^3} = \frac{3^7}{3^7} = 3^{7-7} = 1$

2) $(\frac{-3}{2} \times \frac{1}{2} \times \frac{-4}{3})^2 = 1$

Model 3

First:

1) $\frac{1}{5}$ 2) $\frac{16}{25}$ 3) $\frac{-4}{9}$

Second:

1) 144 2) 5^0 3) $(x^2)^{-2}$

Third:

1) $(\frac{1}{2} + \frac{1}{3})^{-2} = (\frac{5}{6})^{-2} = (\frac{6}{5})^2 = \frac{36}{25}$

2) $\frac{(x^2)^{-3}}{(x^{-1})^2} + \frac{x^{-6}}{x^{-2}} = \frac{x^2}{x^6} = \frac{1}{x^4}$

Geometry Model Answers

Model 1

First:

1) 144° 2) 360° 3) 108°

Second:

1) 900° 2) 120° 3) 8

Third:

1) in quadrilateral FEAR

$\because$ m ($\angle$R) = 120° , m ($\angle$F) = 45°

, m ($\angle$R) = 120°

$\therefore$ m ($\angle$EAR) = 360° − [120 + 45 + 105] = 90°

$\because \overline{ED} \cap \overline{RB} = \{A\}$

$\therefore$ m ($\angle$BAD) = m ($\angle$EAR) = 90° (V.O.A)

$\because$ ADCB is a quadrilateral

$\therefore$ m ($\angle$B) = 360° − [90 + 130 + 80] = 60°

2) $\because \overline{AD} \cap \overline{BC} = \{M\}$

$\therefore$ m ($\angle$BMA) = m ($\angle$CMD) (V.O.A)

in Δ Δ AMB , DMC

- AM = DM
- BM = CM
- m ($\angle$BMA) = m ($\angle$CMD)

$\therefore \Delta$ AMB = Δ DMC

$\therefore$ AB = CD

, $\because$ m ($\angle$B) = m ($\angle$C) [are in alternate position]

$\because$ m ($\angle$A) = m ($\angle$D) [are in alternate position]

$\therefore \overline{AB} // \overline{CD}$

Model 2

First:

1) 9 2) 360° 3) 360°

Second:

1) 120° 2) 540° 3) acute

Third:

1) in Δ ABC

∵ m (∠B) = 180° – [30 + 85] = 65°

∵ $\overline{AB}$ // $\overline{ED}$

∴ m (∠D) = m (∠B) = 65° (alternate)

∵ $\overline{AD} \cap \overline{AF}$ = {C}

∴ m (∠BCA) = m (∠FCD) = 85° (V.O.A)

in CFED

∴ m (∠E) = 360° – [125 + 85 + 65] = 85°

2) ∵ $\overrightarrow{DE}$ // $\overline{CB}$

∴ m (∠B) = m (∠D) = 40° [alternate]

in Δ ABC

∵ m (∠B) = 40° , m (∠C) = 50°

∵ m (∠CAB) = 180 – [40 + 50] = 90°

Model 3

First:

1) 120° 2) 150° 3) $(n - 2) \times 180$

Second:

1) 12 2) 3 3) 360

Third:

1) ∵ Δ FED Equilateral

∴ m (∠F) = m (∠E) = m (∠EDF) = 60°

[properties of equilateral triangle]

∵ $\overline{AE}$ // $\overline{CF}$ = {D}

∴ m (∠CDA) = m (∠EDF) = 60° (V.O.A)

in ABCD

∴ m (∠B) = 360° – [120 + 105 + 60] = 75°

2) ∵ $\overline{AD} \cap \overline{BC}$ = {M}

∴ m (∠BMA) = m (∠CMD) (V.O.A)

in Δ Δ AMB , DMC

AM = DM

BM = CM

m (∠BMA) = m (∠CMD)

∴ Δ AMB = Δ DMC

∴ AB = CD

, ∵ m (∠B) = m (∠C) [are in alternate position]

∵ m (∠A) = m (∠D) [are in alternate position]

∴ $\overline{AB}$ // $\overline{CD}$